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# PERFORMANCE STATISTICS BULLETIN HIGH LATITUDE METEOR SCATTER PROPAGATION AUGUST, SEPTEMBER, OCTOBER 1989

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7 SEPTEMBER 1993



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13. ABSTRACT *(Maximum 200 words)*

A representative sampling of meteor scatter propagation performance statistics is presented from the PL/GP High Latitude Meteor Scatter Test Bed. The data address questions of meteor scatter propagation under disturbed ionospheric conditions, as well as normal meteor scatter propagation in the polar region. The time and frequency variations of the propagation transfer function are characterized over the 35 to 147 MHz range, including the availability of useful meteor trails, the potential communication capacity associated with those trails, the occurrence and persistence of ionospheric scatter and sporadic E-layers, variations in the signal-to-noise ratios of each scatter return and the effects of auroral and polar cap absorption (PCA) events on meteor scatter propagation and communications. Statistics covering Arrival Rate, Duration, Duty Cycle, and Noise Temperature are presented. This bulletin is one of a series of polar meteor scatter data bulletins.

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# Preface

The acquisition and processing of the data represented in this bulletin was a substantial and complex task, and the authors are indebted to the tireless and dedicated efforts of many people. Special appreciation is due Don DeHart for his highly ordered and competent management of the data processing operations and Sergeants Anthony Coriaty, David Mura and Douglas Carter for their spirited first quality workmanship, willingness to risk freezing in the Greenland field facilities and their skilled work in the laboratory. Also deserving of special mention is Eric Li, who was a key player and problem solver in the development of field and data processing software as well as a first quality workman at the frozen Greenland field facilities. Others include Dr. Jay Weitzen and Ms. Patricia Bench who developed the autoclassification and statistical analysis programs used herein.

The meteor scatter performance statistics plots presented herein were selected as a representative sampling of the options available from the PL/GP High Latitude Meteor Scatter Test Bed (HLMSTB) data processing and analysis resource. In addition to the performance information they present, they illustrate the sort of capabilities available to qualified researchers and system designers.

During the period July 1989 through October 1990, the Phillips Laboratory (PL/GP) also operated an additional, trans-auroral Meteor Scatter Test Link between Sondrestrom Air Base and the Danish Meteorological Observatory in Narsarsuaq, Greenland. This link is indicated in Figure 1. of this bulletin. A data base created by that link also exists at PL/GP, Hanscom AFB, however bulletins will not be published for that link.

This issue introduces a revision of the format and content of Plots 115 and 116, which more clearly separates data according to link frequency, and documents system performance and malfunctions. The revisions are discussed in Section 9.

Qualified agencies may request additional data analyses or obtain limited access to the PL/GP resource. Comments and suggestions for improving the usefulness of future bulletins are invited. Please address your comments or requests to:

PL/GPIA, Attention: J.M.Quinn
29 Randolph Rd.
Hanscom AFB, MA 01731-3010.
or TeleFAX (617) 377-3550.

# High Latitude Meteor Scatter Performance Statistics

## 1. INTRODUCTION

This bulletin presents a summary of results obtained from the Phillips Laboratory, Directorate of Geophysics (PL/GP) High Latitude Meteor Scatter Test Bed (HLMSTB) for the reporting period specified. The prime link, from which these data were derived, is approximately 1210 km long and located entirely within the polar cap in northern Greenland, between Sondrestrom and Thule Air Bases. See Figure 1 and Table 1. This link is an enhancement of the Rome Air Development Center (RADC) link described by Ostergaard et.al.[1]

The PL/GP HLMSTB meteor scatter research links in Greenland are providing data to address a number of questions concerning meteor scatter propagation under normal and severely disturbed conditions as well as the potential performance of meteor burst communication systems in the polar region. The efforts under this measurement program are concentrated on characterizing the time and frequency variations of the transfer function, including:

The availability of useful meteor trails,

The potential communication capacity associated with those trails,

The occurrence, persistence and effects of ionoscatter and sporadic E-layers,

Variations in the instantaneous polarization and signal-to-noise ratios of each return from a meteor trail, and

The effects of aurora and polar cap absorption (PCA) events on meteor scatter propagation parameters and on the potential capacity of 35 to 147 MHz meteor scatter communication systems.

Significant disturbance events and anomalies which occurred in this reporting period are identified and their effects discussed under section 10. "Supplementary Information," sub-section 10.2 "Disturbance Events During This Reporting Period."

## 2. HLMSTB SITE AND PATH DESCRIPTION

The PL/GP meteor scatter test-bed main path is located entirely within the Polar Cap region with the transmitter at Sondrestrom Air Base (SAB) and the receiver at Thule Air Base (TAB), Greenland. Figure 1 shows the geographical location of the HLMSTB. Table 1 gives information on the geographical parameters of the sites and path features that influence the properties of the test-bed propagation path.

**Table 1.** Geographical Parameters for the Sondrestrom AB to Thule AB path.

| | Receiver @ TAB | Transmitter @ SAB |
|---|---|---|
| LONGITUDE | 68° 40′ | 50° 39′ |
| LATITUDE | 76° 33′ | 66° 59′ |
| AZIMUTH | 141.8° | 337.8° |
| TERMINAL ELEVATION | 240m | 330m |
| HORIZON ELEVATION | 1.1-1.7° | 1.8-2.2° |

| | |
|---|---|
| MIDPATH ELEVATION for 100 km ALTITUDE | 6.5° |
| GREAT CIRCLE DISTANCE | 1210 km |

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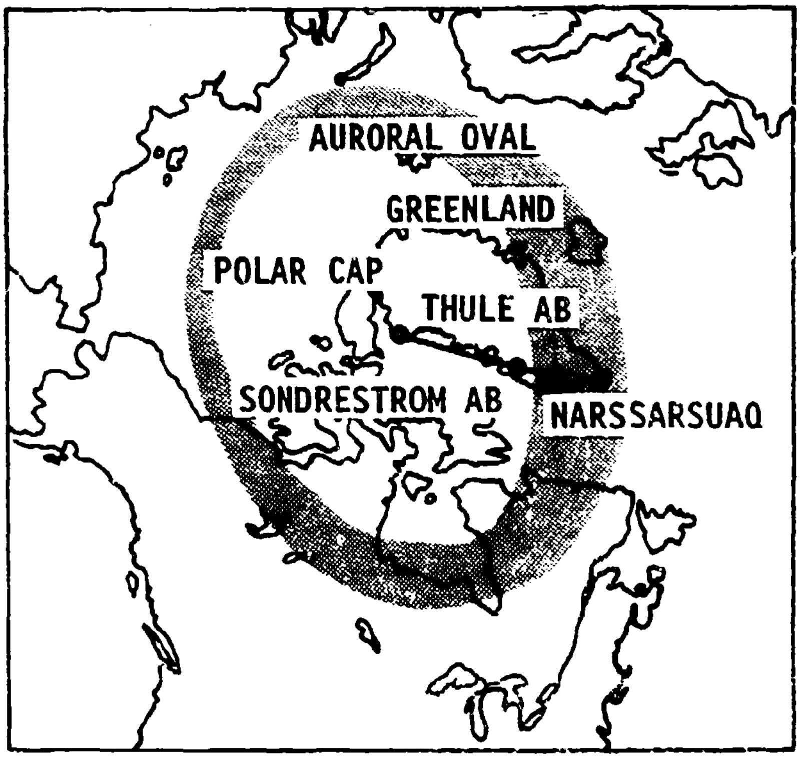
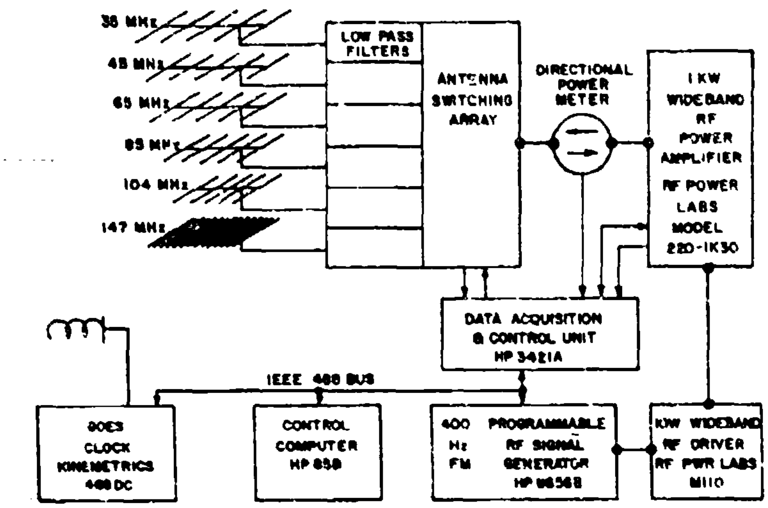



Figure 1. The Geographical Location of the HLMSTB, showing Typical Relation to the Auroral Oval.

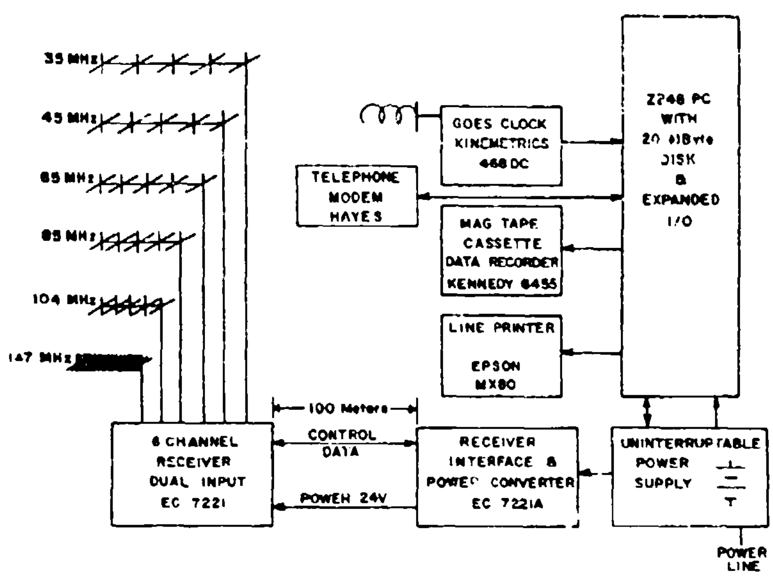
## 3. HLMSTB SYSTEM DESCRIPTION

This Test Bed is designed to measure signal strength, polarization, and system noise at six frequencies, from 35 to 147 MHz.[1] The frequency coverage is chosen to examine absorption and depolarization from the very low end of the VHF frequency band, where meteor scatter links have maximum yield during undisturbed ionospheric conditions, to mid VHF where very little meteor scatter activity takes place but where absorption and depolarization are much less severe than at lower frequencies.

The transmitter at Sondrestrom Air Base and the receiver at Thule Air Base (Figure 2) are not conventional communication system components. Rather, they were developed to investigate features of meteor scatter from a propagation point of view, as well as from a communication viewpoint. The transmitter sequentially transmits a 400 Hz FM tone at 35, 45, 65, 85, 104 and 147 MHz. The receiver at Thule measures the characteristics of the meteor scatter returns as well as signals carried by other modes of propagation, originating from the Test Bed transmitter at Sondrestrom AB.




Transmitter and Control System




Receiver and Data Acquisition System

**Figure 2.** Block Diagrams of HLMSTB Instrumentation for the Sondrestrom AB-Thule AB Link.

The transmitter antenna polarization is horizontal. It uses five-element Yagis positioned for optimum pattern illumination and gain consistency at all frequencies. Receiver antennas are each composed of orthogonal, linearly polarized (Yagi) antenna pairs for measurement of the horizontal and vertical polarization components. The Yagis are mounted on a common boom with separate lines feeding a six frequency, dual channel receiver with two identical channels at each frequency. Thus the amplitude for each polarization and phase difference between the signals received by the orthogonal antennas can be acquired and used to determine the polarization of the incident wave. The effective noise bandwidth of the receiver is 100 Hz.

## 4. DATA ACQUISITION

The horizontal and vertical polarized channels are sampled every 10 msec (100 samples/sec) and formatted into sequential 5-second records that include signal power of the polarized channels, the phase difference between the vertical and horizontal channels and a flag indicating lock-on to a 400 Hz FM signature. Record displays are shown in Figures 4-8. Those records in which the 400 Hz signature is detected are transferred to a magnetic tape data storage unit and data tape cartridges are returned to the Phillips Laboratory for processing.

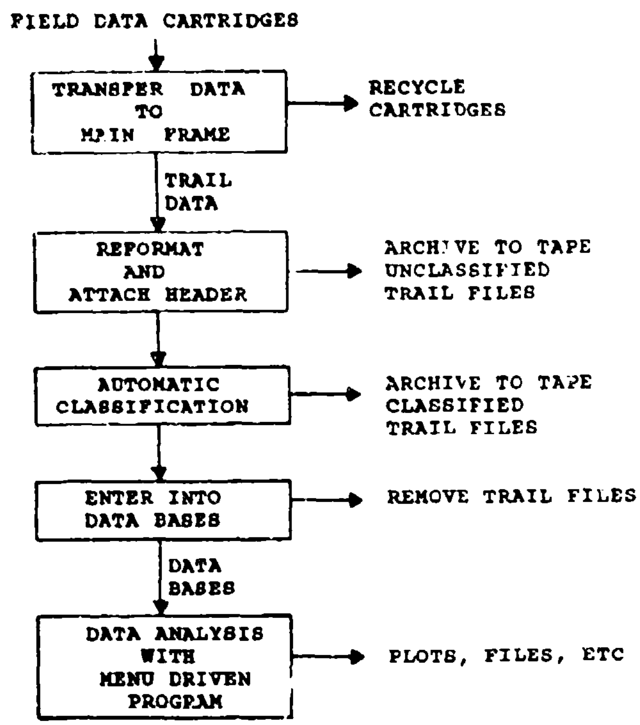



Figure 3. Procedure for Analysis of Data from PL/GP High Latitude Meteor Scatter Test Bed.

## 5. DATA PROCESSING[2]

The data processing procedure is shown in Figure 3. Data are transferred to the PL/GP VAX computer and the date, time, noise level, frequency, and other information are attached to each data record. The next step is classification, where the dominant propagation mechanism in each data record or sequence of records is identified. The final step of the processing procedure is statistical analysis of data in the data bases. These classified data bases can be processed in a number of different ways.[3] The main menu of optional categories appears as Table 2. The principal purpose of this bulletin is to present a representative sample of analyzed data for the specified three month period.

## 6. CLASSIFICATION[4]

Several different propagation mechanisms are observed on the high latitude test bed. These different propagation mechanisms have different communication and propagation characteristics. In addition to underdense and overdense meteor trails, sporadic-E and low level ionospheric scatter propagation occur frequently. Auroral scatter is not generally observed on the Thule test link, since it is well North of the auroral zone.

**Table 2.** Main Menu; Statistical Analysis Options.

| | |
|---|---|
| 101 | Number of arrivals exceeding a RSL threshold |
| 102 | Number of arrivals exceeding a SNR threshold |
| 103 | Distribution of time above a RSL threshold |
| 104 | Distribution of time above a SNR threshold |
| 105 | Noise level and link-up time history |
| 106 | Distribution of durations above RSL threshold |
| 107 | Distribution of durations above SNR threshold |
| 108 | Time constants |
| 109 | Fading Statistics |
| 201 | Throughput for idealized adaptive system (for all events) |
| 202 | Throughput for idealized adaptive system (for all frequencies) |
| 203 | Throughput for realistic adaptive rate system (all frequencies) |
| 204 | Throughput for realistic adaptive rate system (all events) |
| 205 | Throughput for realistic fixed rate system (for all frequencies) |
| 206 | Throughput for realistic fixed rate system (for all events) |
| 207 | Time required to transmit a message (for fixed rate system) |

The classification system includes four categories of return: underdense meteor trails, overdense meteor trails, sporadic E-layers and unidentified propagation. Some of these classes contain waveforms that agree closely with the classical theory of meteor burst scattering as presented by Eshlemann[6] and McKinley;[6] however, most of the trails are distorted and often difficult to classify. The sporadic E-layer signals are distinctive as they are generally stronger and much longer lasting with slow fades. The remaining low level, fast fading signals are classified as unidentified propagation as they cannot be attached unambiguously to a specific physical propagation mechanism.

## 6.1 Returns from Underdense Meteor Trails

The returns from underdense trails are characterized by a fast rising leading edge and a slower exponential decay. They account for by far the largest percentage of signals observed. Figure 4. shows a number of returns from underdense trails. The maximum amplitudes of the waveforms vary over a range of 40-45 dB and the durations vary from less than 0.I seconds to several seconds. The occurrence of long duration trails is not well correlated with large maximum amplitude, as both returns with a long duration and a small maximum amplitude, and returns with a short duration and large maximum amplitude are frequently observed.

Many underdense returns exhibit fading during their exponential decay phase. This phenomenon is observed on nearly all long lasting trails, and it is attributed to wind moving different portions of the trail to positions and attitudes that fulfill the geometric conditions for scattering between the transmitter and the receiver. These fades can be deep, occasionally reaching down to the receiver noise level; that is, a complete cancellation of the total received power by destructive interference between components of the received signal originating from different parts of the trail (Figure 5.)

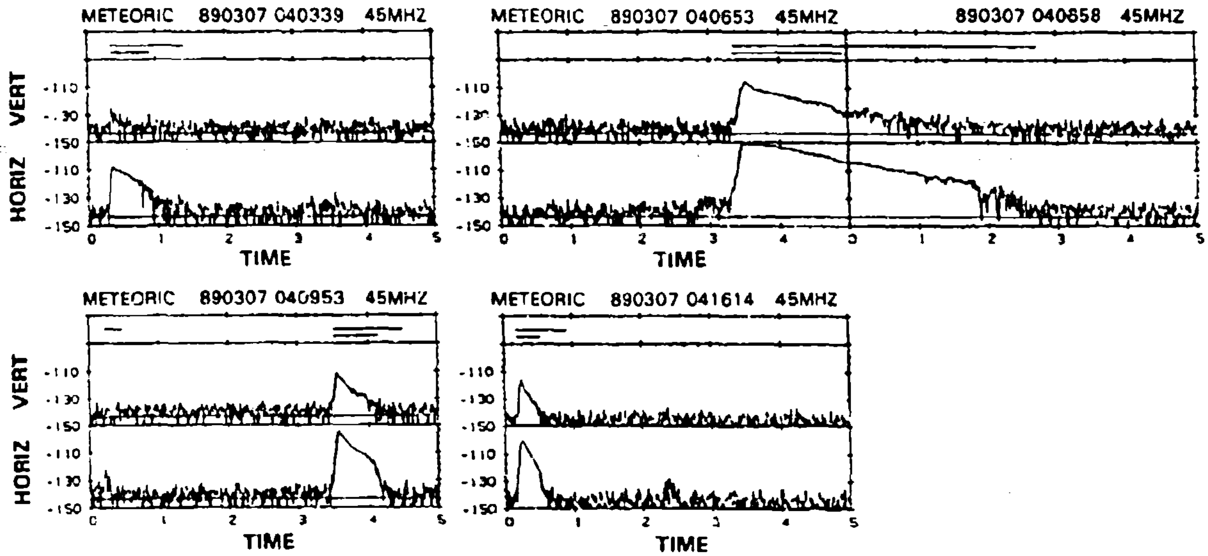



Figure 4. Examples of returns from underdense meteor trails.

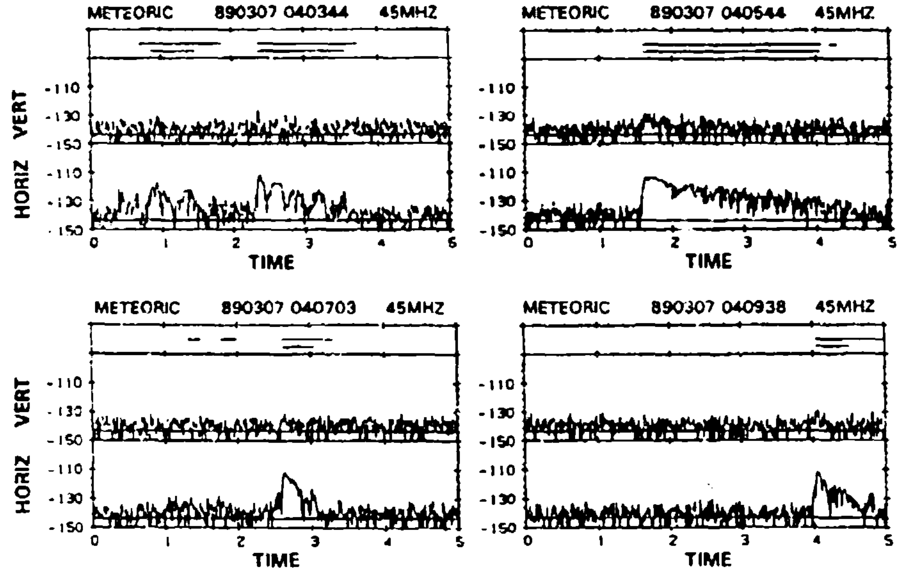



Figure 5. Examples of returns from underdense trails with fading from "wind distortion".

The time between the occurrence of successive meteor trails ranges from as little as a few milliseconds to several minutes. Trails often occur with separations of the order of one second or less. The multiple meteor trail returns can either be of approximately the same amplitude or of substantially different amplitudes, and it cannot at present be determined if the two signals came from portions of a fractured micrometeoroid, that is, have the same path through the scattering geometry, or if they are caused by two independent meteorites with entirely different paths.

## 6.2 Returns from Overdense Meteor Trails

The returns from overdense trails are characterized by a fast rising edge, often followed by an amplitude oscillation originating from the meteorite's movement through the scattering geometry during the formation of the trail. Unlike the returns from underdense meteor trails, however, the amplitude continues to increase after the trail is fully formed, and reaches a shallow maximum before decaying exponentially. Examples of returns from overdense meteor trails are shown in Figures 6 & 7.

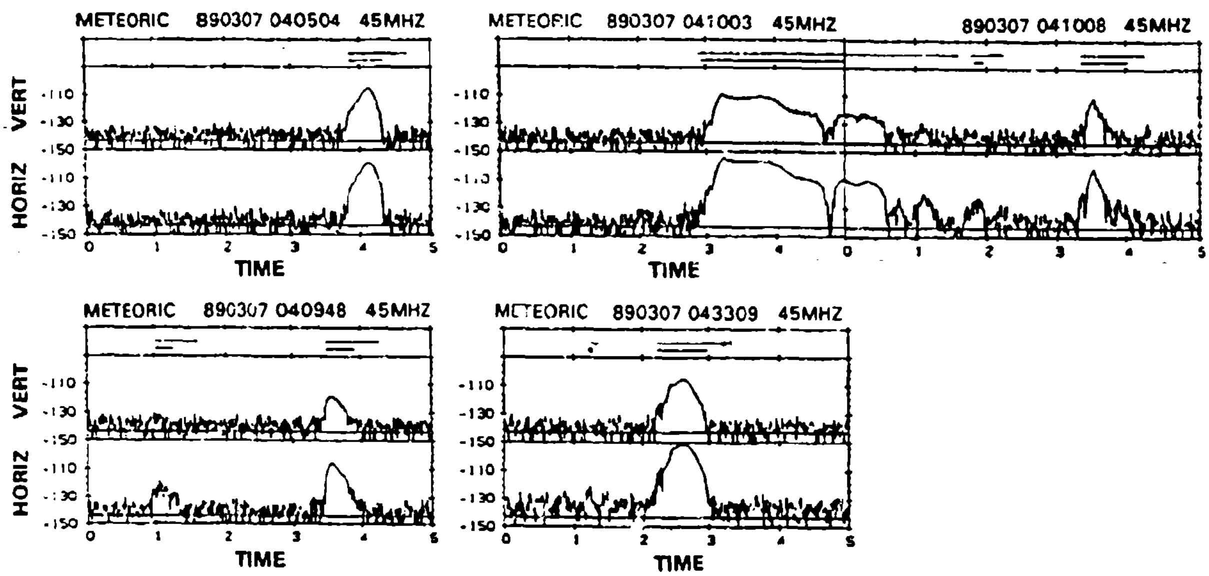



Figure 6. Examples of returns from overdense trails.

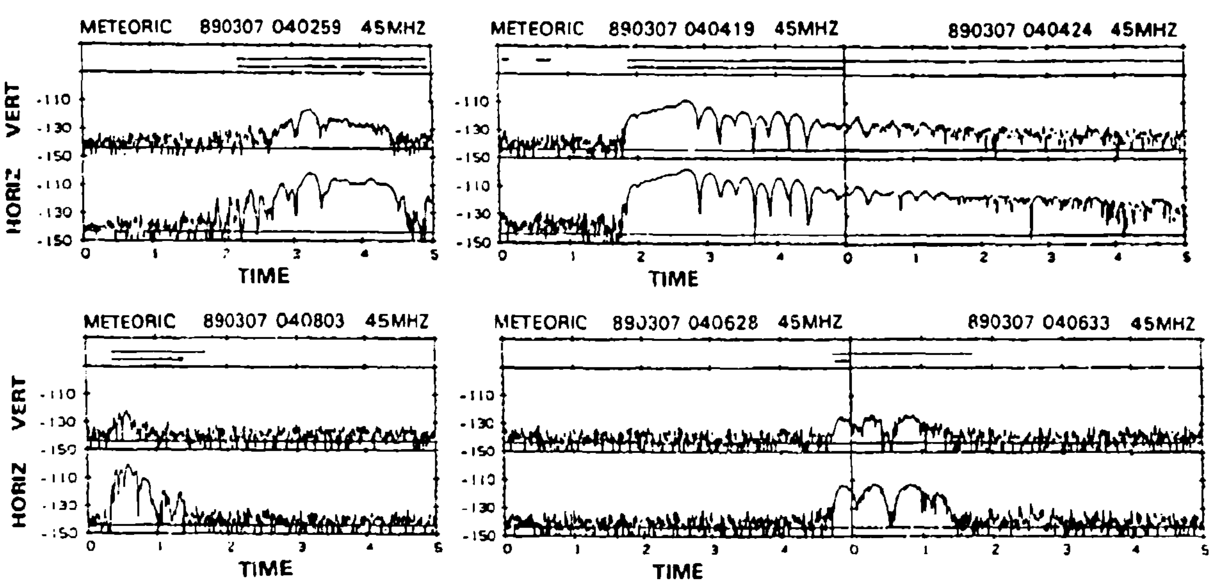



Figure 7. Examples of returns from overdense trails with fading.

The maximum amplitudes are generally larger and the durations longer than those from underdense trails. The majority of the waveforms that last longer than 1 sec can be classified as returns from overdense trails. There are, however, a number of returns from overdense trails for which the maximum amplitude is comparable to the average maximum amplitude for returns from underdense trails, and which last considerably less than a second.

As the overdense trails generally tend to last longer, they are prone to wind distortion, which creates multipath propagation and large fluctuations in the received power. Some of the returns from overdense trails could be interpreted as either a return from a wind distorted overdense trail, or as a return from a trail that did not originally fulfill the required scattering geometry, but has been repositioned by the wind after the trail was fully formed.

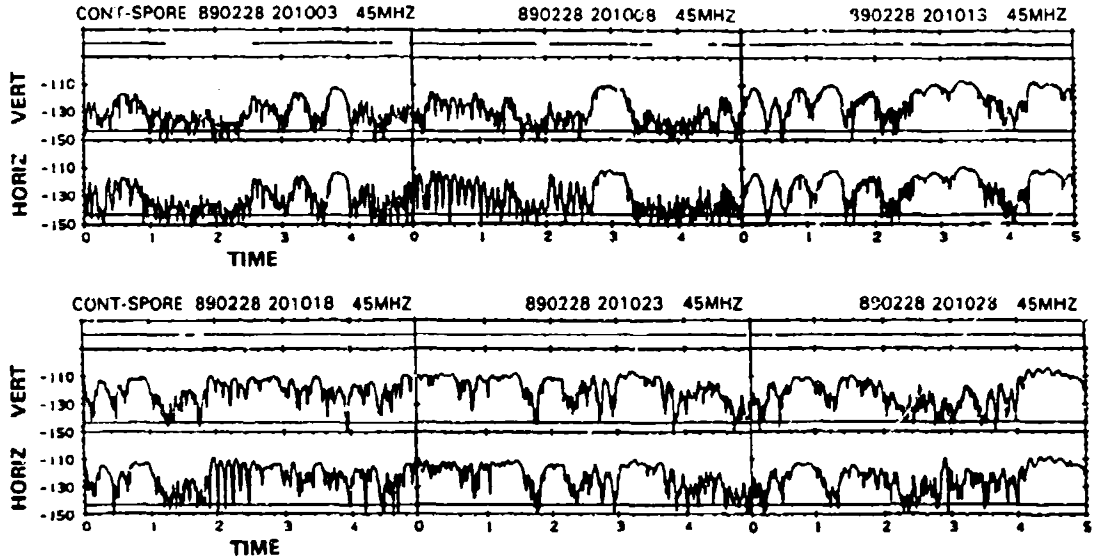



Figure 8. Examples of returns from Sporadic E-layers.

## 6.3 Returns from Sporadic E-Layers

This classification is used to account for the occurrences of very strong (up to -75 dBm), long enduring signal events which can last from a few minutes to more than 25 minutes. The signals are observed primarily at the lower frequencies (35 and 45 MHz). Examples of signals reflected from sporadic E-layers are shown in Figure 8.

These signals obviously do not originate from meteor trails, nor can they originate from the ionosphere's F-layer, as this does not reflect obliquely at VHF frequencies on a path as short as the Sondrestrom AB - Thule AB path. The logical explanation is that the signals originate from sporadic E-layers. These layers are known to occasionally have electron densities large enough to permit oblique reflections at frequencies in the lower VHF spectrum. The main characteristics of the signals, apart from their long duration, are the large amplitudes and the slow, deep fades. The fades generally exhibit a periodicity of 0.1 sec to 2 sec.

## 6.4 Unidentified Propagation

Occasionally, relatively weak, long lasting signals characterized by rapid fading, are received. These superficially fit the description of scattering from field aligned irregularities as reported by Dyce.[7] However, such scattering as a mode of propagation is not plausible for

irregularities at F-layer heights and it is very unlikely, even for irregularities at E-layer heights, due to the geographical position of Sondrestrom AB and Thule AB relative to the nearly vertical inclination of the geomagnetic field. These signals often precede sporadic E events and they may in the future be reclassified as returns from weak sporadic E-layers. Unidentified signals are presently excluded from standard analysis options.

## 7. ANALYSIS OPTIONS

Information in the monthly data bases can be retrieved and processed using a menu-driven front end program that calls a subset of processing routines. The main menu is shown in Table 2 Each of the main options offers approximately ten sub-options that allow the user to analyze the propagation and communication properties of the channel. Statistical analysis is divided into two general categories; propagation analysis, lines (101-109), and communication analysis (201-207).

### 7.1 Propagation Analysis

Propagation statistics allow analysis of the arrival rate of trails. their duration, duty cycle and fading characteristics as a function of trail type, signal level, time of day, day and frequency. These statistics can be used to examine the effect of disturbances, such as polar cap absorption or solar noise storms, as well as to calibrate physically based prediction models such as METPRED* or METEORLINK**.

### 7.2 Communication Analysis

Communication statistics allow a user to define a system and infer its performance over the test link from actual data. Parameters that can be defined by the user are the data rate, modulation, error rate, packet structure, and signaling protocol. Users can specify either a fixed data rate system or an adaptive data rate system. Available statistics include time to deliver a message and throughput as a function of time of day, event type (underdense, overdense or sporadic-E), frequency, data rate, packet duration, error rate and packet structure. Output of the analysis program is presented in either table form or in files that can be plotted using a number of optional routines. (Communications statistics will not be included in this bulletin series.)

## 8. STATISTICAL DATA BASE

The following data base descriptions are included to provide the reader with introductory background to aid interpretation of the presentations of this report. Available data bases are:

Meteor arrivals data
Distribution of signal durations data
Underdense time constants data
Duty-cycle data
Link history data
Fading data

### 8.1 Meteor Arrivals Data Base

The number of meteors that exceed a signal threshold is determined for each time period as a function of signal threshold, frequency, time of day, trail type and polarization. Information in this data base can be used to observe the fluctuation in arrival rate during ionospheric disturbances such as polar cap absorption (PCA) events, to determine the frequency dependence of the arrival

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* METPRED is a proprietary Meteor Burst prediction model owned by Signatron Corporation.

** METEORLINK is a proprietary Meteor Burst prediction model owned by Scientific Applications International Corporation.

rate as a function of time of day or season, to observe the relationship between received signal and number of trails, to observe and analyze the cross polarization dependence as a function of time of day and season, or to determine the percentage of trails that are underdense or overdense as a function of received signal level and frequency. Arrival rates of meteor trails (meteors per minute) that satisfy the user specified signal requirements are computed by dividing the number of meteors that satisfy the signal criteria by the time the link was available to observe meteor trails. Available time takes into account the time the link was not observing meteors due to sporadic-E or ionospheric propagation, as well as link down time.

Data analysis routines can combine the received signal information in the arrival data base with noise level information in the link history data base to compute the arrival rate of meteors as a function of signal-to-noise ratio (SNR). This information can be used to predict the arrival rate of meteors useful for communication. In this and all other data bases, statistics are computed as a function of received signal level in increments of 2 dBm from -140 dBm to -90 dBm, covering the range of signals observed on the link.

## 8.2 Distribution of Signal Durations Data Base

The signal durations data base contains information on the durations of meteor and ionospheric signals above various received signal thresholds. Duration statistics are required to determine the average throughput and message delivery time of the channel, especially for realistic systems that transmit data in fixed length packets. For each signal event within a record or sequence of records, the times relative to the start of the record that the signal either exceeds or drops below the threshold is noted in a table. Since communication systems have some inherent capability to combat fades, the processing routines merge fades that are less than 40 ms in duration. Duration statistics are computed as a function of duration, received signal level, day, time of day, frequency, and propagation type (underdense trails, overdense trails or ionospheric).

Information stored in this data base as a function of received signal level can be transformed by the analysis routines to a function of signal to noise ratio by combining received signal information in this data base and noise information in the link history data base. Data in this data base can be used to optimize the design of communication protocols based upon the duration of meteor trails and to add to the understanding of the contribution of overdense and underdense trails to the performance of a channel.

## 8.3 Underdense Time Constants Data Base

Underdense meteor trails are observed to decay exponentially with a time constant that is a function of trail height, link distance, trail orientation, and frequency. In most work, the time constant of decay is assumed fixed for a given link, but in reality it is a random variable. Statistics of the duration and time constants are required for the generation of accurate meteor burst communication simulations. For each trail identified by the trail classifier as underdense, a minimum mean square error exponential fit to the trail is performed beginning at the maximum signal point to determine the decay constant. The statistics of the time constant are determined as a function of time of day and frequency, averaged over each month.

## 8.4 Duty-cycle Data Base

Duty cycle is the time the signal exists above a threshold divided by the total number of seconds the link was active (removing time that sporadic-E was dominant when analyzing meteor trails). This statistic is computed as a function of time of day, frequency, polarization, signal level, and propagation mechanism (underdense trails, overdense trails and ionospheric propagation). The relative contribution of the various mechanisms to the capacity of the channel can be evaluated.

For each meteor in a data record or sequence of data records, identified by the trail classifier, the number of seconds that the received signal level exceeds the threshold is computed and the appropriate duty cycle data slot is incremented. For records identified as ionospheric, the total duty cycle for the 5 second data record is computed and the appropriate data slot is incremented.

Information in this data base is combined with the noise information in the link history data base to determine the duty cycle as a function of signal-to-noise ratio, which is used to determine the capacity of the channel at a fixed bit error rate.

### 8.5 Fading Data Base

This data base provides information about the fading of the envelope of meteor trails and ionospheric propagation events. A fade is said to occur when the signal to noise ratio drops more than 3 dB below 10 dB signal-to-noise ratio, relative to the specified bandwidth and then goes back above the threshold during the life of a trail. The thresholds considered are 10 dB SNR relative to 100, 300, 600, 1200, 1600, 2400, 4800, 8000, 9600, 19200, 32000, 64000, and 128000 Hz bandwidth.

$$\text{Threshold above noise(dB)} = 10 \log(10^{((10 + 10 \log(Bw/100))/10)} + 1).$$

(The 1 takes into consideration (S + N)/N.)

Fades per second are computed as the number of fades per event divided by the duration of the event. If the duration of the fade is greater than one second, we assume the beginning of a new event. For meteor trails, three statistics are computed; 1. fades per trail, 2. fades per second of event duration and 3. distribution of fade durations. For Sporadic-E, only the latter two statistics are available and meaningful.

### 8.6 Link History Data Base

The link history data base archives miscellaneous information about the link from each frequency period during the day. The data base contains information on the received noise level measured during the one minute preceding each frequency interval, the number of seconds during which ionospheric propagation (e.g. Es) was the dominant mechanism, transmitter power recorded at the beginning of each frequency interval, and a flag indicating if no returns are received during the interval.

The noise information is combined with absolute signal level information in the other data bases to transform received signal level to signal-to-noise ratio (SNR) for communication analysis. The other information is used by the analysis program to determine meteor arrival rates accurately by evaluating the amount of time during each frequency interval that the system was actually available to observe meteors.

The transmitter power log database, although sometimes erratic or incomplete, is edited and then used to remove questionable intervals of data from the calculation of monthly average statistics. Editing is based on a review of the signal database, and verification that power deviates from the months norm by less than 1 dB. Intervals where power or reception is clearly and persistently below the monthly norm are rejected.

## 9. DATA PRESENTATION AND FORMAT

The appendices of statistics plots presented in this bulletin are only a sampling of the available propagation statistics options outlined in Table 2. Each appendix covers one month. The plots presented, in Appendices A through C, have been limited to those categorized as propagation

statistics, with attention focused on the "arrival rate" and "duty cycle" as functions of signal level, signal propagation mode and link frequency. Although communication statistics may be as readily obtained, they are omitted here because such data are highly system dependent so even a small "typical" sampling might overwhelm the function of this bulletin.

Table 3 is an outline of appendix plots, identified by plot number and arranged in groups that include a range of screening parameters, such as Time-of-Day, RSL-threshold, propagation-mode or link-frequency. The ordinate and abscissa data are indicated as well as the compared parameters and the range of incremented screening parameters for each group. Table 3 is applicable to each monthly Appendix, A through C.

Those statistics plots presented as monthly averages are calculated excluding periods of sub-standard link performance and extraordinary events such as PCA's, and link outages. These periods are indicated in plots 115. Power information in plots 115, is edited to remove intervals of questionable performance and PCA events. Calculations of system throughput are based on an assumption of a 30 dBW transmitter feeding specific antennas as described in Section 3. However, average true power deviated from this by as much as 1 dB, depending on frequency and operating conditions, and in rare cases varied up to as much as 1 dB under stressed conditions. Intervals of high absorption (PCA's) are also removed from calculation of monthly averages, and are not displayed in plots 115. However, where valid, propagation data AR, DC, etc. are displayed against day-of-month (DOM) and time-of-day (TOD).

The format of plots 115 (Link Availability/Power) and 116 (Noise Temperature) are revisions of the congested displays presented in earlier Bulletin issues.[8 9] Plots 115 now display separate records of transmitter power for each frequency, during those data intervals which are included in the calculation of monthly average statistics. Disturbance (PCA's) and outage intervals are also removed from the calculation of monthly averages, and from the power display, plot 115.* Plots 116 now display separate records of noise temperature for each frequency, with a scale of the logarithm of noise temperature in degrees Kelvin.**

Arrival Rate (AR) has been defined as the number of classifiable meteor trail returns per minute exceeding a specified received signal (RSL) or signal-to-noise ratio (SNR). Duty cycle has been defined as the ratio of the accumulated time in which classifiable meteor trail returns exceed the specified RSL (or SNR) threshold, divided by the valid listening or acquisition window. Arrival Rates and Duty Cycle (DC) are presented in Plots vs Time, RSL and SNR. These plots are presented so as to compare either mode-classification or link-frequency. The majority of plots are presented vs Time-of-Day (TOD) as averaged over the month. Other plots showing distrbutions as a function of RSL or SNR are presented as 24 hour-whole month averages. However, selected hour intervals averaged over the month can be obtained.

Trail return "Duration" is also available as a function of all the parameters illustrated here. A small sampling of "Duration" data is included as Normal Distributions of Numbers of Returns vs Duration of Return.

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*Earlier practice included no transmitter power information, but instead plotted link-up time for all frequencies as daily percentages, and on a common scale.

**Earlier practice displayed noise at all frequencies on a common linear scale, resulting in occasional confusion from overlapping records.

The plots presented here were generated by an automated batch process. Consequently, the sequence of presentation and the presentation format are determined at the convenience of the software architect. Most plots are presented two-to-a-page. A notation at the lower right of each includes a menu identification and a batch plot number. The plot number is referred to by the Table 3. The menu I.D. may be related to Table 2, but also includes submenu selections that are not treated here.

A "**polarization = horizontal**" notation appears with plots no. 1-66. All data presented in this bulletin are based on signals received on horizontally polarized receiving antennas. The PL/GP database and analysis software includes the option to present either horizontally or vertically polarized reception from the horizontally polarized transmissions.

A "**maximum downtime due to sporadic-E = 240 secs.**" notation appears with plots no. 1-30. This refers to the default convention to delete from analysis that data acquired in any bi-hourly acquisition window which included more than 240 seconds of returns classified as sporadic-E. The reader may notice a significant impact on plots presenting data at 35 and 45 MHz. since $E_s$ propagation may frequently dominate at polar cap latitudes, resulting in gaps in the data that are plotted versus Time of Day (TOD).

A "**based on observed noise measurements = vertical**" notation appears with plots 28-30, 61-66, 94-97, 115 and 116. Several sources of noise measurement data are available. Noise measurements are made at each transmitting frequency transition from both horizontally and vertically polarized receiving antennas and, in addition, each trail record is processed to extract an apparent noise level which is averaged over the acquisition window. The default noise reference is measured from the vertically polarized receiving antennas.

A "**effective system bandwidth = 100 Hz.**" notation appears with plots 28-30, 61-66, and 94-97. This is a trivial reference to the system effective noise bandwidth.

Plots 67-87, 94, 95, 100-106, and 108-114 are normalized distributions of trail return durations, or decay time-constants. The "**normalizing factors**" indicate the extent of data available for each mode.

The format of plots 115 (Link Availability/Power) and 116 (Noise Temperature) are revisions of the congested displays presented in earlier Bulletin issues.[8,9] Plots 115 now display separate records of transmitter power for each frequency, during those data intervals which are included in the calculation of monthly average statistics. Disturbance and outage intervals are removed from the calculation of monthly averages. Our earlier practice included no transmitter power information and plotted daily percentages of link-up time for all frequencies on a common scale.

Plots 116 now display separate records of noise temperature for each frequency, with a scale of the logarithm of noise temperature in degrees Kelvin. Our earlier practice displayed noise at all frequencies on a common linear scale, resulting in occasional confusion from overlapping records.

## 10. SUPPLEMENTARY INFORMATION

To aid interpretation, selected supplementary data are included in plots 117 through 123. These data are indicators of ionospheric disturbances that can significantly degrade radio propagation. The magnitude of the polar magnetic field, as recorded on a three-axis fluxgate magnetometer, and riometer data from two 30 MHz units, are recorded at one-minute intervals by instruments located near the Test Bed receiver operated by Phillips Laboratory at Thule Air Base in

Greenland. The riometer measures the signal level of cosmic noise through the ionosphere. A decrease in received noise level results from increased absorption caused by enhanced ionization from energetic particles. The magnetometer responds to polar ionospheric current systems that may be related to disturbances.

## 10.1 Ionospheric Disturbances

The polar ionosphere is a turbulent region, subject to a range of disturbances primarily related to solar activity. When such disturbances occur they may distort the monthly average statistics, depending on the duration and severity of the events. Such disturbance events may appear as extraordinary absorption, noise, or non-meteoric propagation. Monthly average statistics presented here do not include identifiable propagation disturbances. However, data presented versus day-of-month do include these events. Typical disturbance events are discussed below.

Of special interest during this report period is a VLF/LF ionospheric sounder, operated at Thule AB by PL/GP until 1990. This sounder was based between Thule Air Base and the Danish Meteorological Observatory at Qanaq, Greenland. The enhancement of HF/VHF absorption created by a particle storm is the consequence of the increase in electron density in the lower D-region. This appears at VLF/LF frequencies as a depression of the "mirror height." Klemetti et.al.[10] present the results of VLF/LF ionosounder measurements of the ionospheric reflection height and reflection coefficients for the same disturbances observed in this report.

In the discussions to follow, a shorthand reference to plot content is used where Y(p)vs.X is employed. Ordinate data Y are usually arrival rate (AR) or duty cycle (DC), the parameter (p) may be received signal level (RSL) or signal to noise ratio (SNR), and abscissa data X may be day of month (DOM) or time of day (TOD). References to NOAA/USAF numbered sunspot events and GOES-7 proton [illegible] are obtained from the NOAA/USAF Solar Geophysical Data reports*

### 10.1.1 Absorption Events

The effects of energetic solar-particle events are seen on a riometer as an abrupt increase in the signal absorption level followed by a gradual recovery to normal levels over a period of hours or days. Diurnal variations in the level of absorption are caused by variations in the amount of solar illumination of the ionosphere. During absorption events two propagation effects can occur. One is the attenuation of the signal traversing the absorbing region; the other is depolarization. However, although polarization data are collected by the HLMSTB, depolarization analysis is not included in this bulletin series.

Two types of absorption can be encountered: Polar Cap Absorption (PCA), affecting signals penetrating the D-region inside the polar cap, and auroral absorption, mainly confined to paths penetrating the upper D-and lower E-regions of the ionosphere in the auroral oval. PCA events cover the entire polar cap with a blanket of additional D-region absorption. The magnitude of this absorption, as measured by a 30 MHz riometer at zenith, can exceed 10 dB.

PCA's can last days, or even weeks in severe cases. Auroral absorption events tend to be patchy, last for a few hours, and produce 30 MHz riometer absorption values of up to 2-3 dB as measured towards zenith. These absorption events will affect the received signals and the system noise differently. The magnitude of the absorption decreases with an increase of the elevation angle of the propagation path and with an increase in the frequency of operation. Whereas

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*Solar-Geophysical Data reports obtainable from; NOAA/NESDIS,E/GC2, 325 Broadway, Boulder CO 80303.

received meteor-reflected signals traverse the absorbing region twice, generally at a low elevation angle, noise of galactic origin traverses the absorption region only once, and at a range of elevation angles dependent on the extent of the antenna radiation pattern. As a consequence, the noise is absorbed significantly less than the meteor signal. A comprehensive treatment of absorption effects on meteor scatter propagation, illustrated with examples from the PL/HLMSTB links during events of March and August 1989, can be found in Ostergaard et.al.[11] [12] [13]

### 10.1.2 Noise Events

Noise events are not as common as absorption events. The effects of absorption events are a function of frequency, whereas solar noise tends to be broadband and may affect any or all frequencies across the VHF spectrum. These events can result in an increase in received noise of tens of dB; however, solar noise effects are seen only when the sun is visible to the antenna. Such noise events can last for several days. Occasionally, as in early August of this reporting period, non-solar noise may appear, which will be difficult or impossible to identify as to cause or source.

### 10.1.3 Non-Meteoric Propagation

Although not a disturbance in the disruptive sense, this extraordinary mode of propagation has a very significant impact on the performance and analysis of a meteor scatter propagation link. This classification, introduced in Sections 6.3 and 6.4., includes long enduring signal events that can last from a few to many minutes. These signals are observed primarily at the lower frequencies (35 and 45 MHz). Most of these returns are attributed to sporadic E-layer (Es) reflection. These layers, with electron densities large enough to permit oblique reflections at frequencies in the lower VHF spectrum, produce signals with long duration, large amplitudes and slow, deep fades. Consequently, when present they can dominate the propagation link. This is especially true in the polar region, and overwhelmingly so at the lower frequencies during the summer months.

## 10.2 Disturbance Events During This Reporting Period

During this report period the Thule based riometer Plots (119) show three major absorption events commencing 12 August, 29 September, and 19 October. Leading into the 12 August PCA (7-13 August) and on 3 September, were noise storms observeable in plots 116. The August storm is extraordinary for its lack of the diurnal cycling typical of solar event noise when observed by a high gain unidirectional antenna. Other episodes of interest include; the Perseid meteor shower on 11-12 August, several partial system outages as listed below, and Thule riometer anomalies (plots 117-120), which include a displacement on 6-7 September from a test-swap of instruments, and a calibration exercise on 13 September.

In summary:

Polar Cap Absorption events:

| | |
|---|---|
| 12 Aug. - 21 Aug. | 10 dB max., 13 August. |
| 29 Sept.- 2 Oct. | 9 dB max. |
| 19 Oct. - 28 Oct. | 18 dB max., 20 Oct.; 3-8 dB daily. |

Noise events:

| | |
|---|---|
| 3 Sept. | Solar noise |
| 7-13 Aug. | Persistent noise, at 85, 104, and 147 MHz. |

Perseid meteor shower:

11-12 Aug.

System outages:

| | |
|---|---|
| 13-14 Aug. | -at 45 & 85 MHz. |
| 22-23 Sept | -at 65 MHz. |
| 25-27 Sept. | -at 147 MHz. |
| 28-29 Sept. | -reception, 45 and 104 AR, 147 noise. |
| 19-20 Oct. | -at 35 MHz. |
| 28-29 Oct. | -reception, 45, 85 and 147 MHz. |

August and September display a significant impact from non meteoric sporadic E-layer (Es) propagation. However, the very high summer levels of Es propagation are waning[9] and settle to background levels by October. August and September Es propagation dominance at lower frequencies is seen in DC(RSL) vs. TOD plots 37, 38, 43, and 44. Other evidence of dominant Es propagation is found in Duty Cycle (DC) vs. Received Signal Level (RSL) plots 31, 32, and Duration vs. RSL plots 67, 68, 73, and 74.

### 10.2.1 Absorption and Outages

Absorption reference data from one riometer at Thule AB is presented in plots 117 and 119. (Plots 118 & 120 for August and September are omitted in this bulletin because of instrument malfunction.) The September and October absorption events exhibit a high diurnal variability since the link is in a polar equinox night/day shadow region. The August event variability is much lower since the polar link sees 24 hours of sunlight during the summer. High levels of noise in plot 117 for October have been identified as skip interference from distant HF communication activity.

The 12-21 August absorption continued at high levels for a week. The Thule riometer peaked at 10 dB on 13 August and sustained levels above 3 dB through 19 August. This event correlates with a Solar Proton Event (SPE) resulting from repeated eruptions of solar flares from sunspot NOAA/USAF #5629, reported in NOAA Solar-Geophysical Data reports. X-ray flares are reported as X2.6 (12 Aug.), X3.5 (14 Aug.), X1.0 (15 Aug.) and X20 (16 Aug.). GOES-7 measured flux levels of protons > 8.7 Mev at 10 to 500 particles/cm$^2$ sec.sr MeV during 12-18 August, with sustained levels exceeding 200 particles/cm$^2$ sec.sr MeV throughout 13 August. Normal background is typically less than 0.1 particle/cm$^2$ sec.sr MeV.

The 29 September event achieved 10 dB riometer absorption levels on two consecutive days, diminishing to 3 dB on 1 October. This event correlates with a 29 September eruption of an X9.8 solar flare from sunspot NOAA/USAF #5712. GOES-7 measured flux levels of protons >8.7 MeV above 100 particles/cm$^2$ sec.sr MeV between 18 UT on 29 Septenber and 6 UT on 1 October.

The 19 October event achieved daily absorption maxima exceeding 3 dB for eight days, approaching 18 dB on 20 October. Several solar events throughout the week maintained a high proton flux and high absorption conditions. The sunspot NOAA/USAF #5747 produced X-ray flares of X13 (19 Oct.), X2.9 (22 Oct.) and X1.5 (23 Oct.). GOES-7 measured flux levels of protons > 8.7 MeV as high as 4000 particles/cm$^2$ sec.sr MeV (20 Oct.) and 100 and 400 on 22 and 23 October respectively.

Frequent, although brief, system outages occurred during this report period, especially in the latter days of each of the months of September and October. Monthly average statistics, plotted versus TOD, are calculated with outages and absorption events excluded; however these outages do confuse the interpretation of statistical displays of AR and DC plotted versus

TOD/DOM, specifically plots 25-27, 30, 55-60, 65, and 66.* In the following paragraphs we attempt to guide the reader through an examination of the plots, to distinguish the impacts of system failures from those of natural disturbances, especially PCA events.

**System outage** evidence appears in plots 115, which monitor transmitter power and periods of non-connectivity during undisturbed times.** Regrettably, intermittent system outages interrupted data acquisition briefly during several disturbances of interest in this report period. Logged data reveals transmission failures at 45 and 85 MHz between 6:00 UT of 13 August and 20:00 UT of 14 August, at 35 MHz on 19-20 October, and intermittently at other times during crucial periods of high absorption, as recorded in plots 117 and 119.

Outages in September do not appear to seriously interfere with monitoring of natural events, but do confuse plot interpretation. AR and DC dropouts between 22 and 29 September, especially 25-29, are caused by system malfunction and should not be confused with PCA effects. September plot 116 also shows gaps in noise data between 25-29 September. The impact of these outages is apparent in all AR or DC vs.DOM plots, 25-27, 30, 55-60, 65, and 66.

**Consequences** of the PCA events and system outages are immediately apparent in plots 25-28, 30, 55-60, 65, 66, and 116, for each episode. AR(RSL)vs.DOM plots 25-27 and AR(SNR)vs.DOM plot 30 show the impact of PCAs as a function of link frequency. The AR of detectable trails at 45 MHz diminishes in correlation with the riometer absorption data. On August 12 the AR at 45 MHz dropped by a factor of 10 and showed very deep depressions on 15-17 August. Transmissions at 45 and 85 MHz failed on 13-14 August. 45 MHz AR dropped out from late 29 and 30 September, also showing some depression on 1 October. A similar signal drop-out pattern is apparent in the DC(RSL)vs.DOM plots 55-57 and DC(SNR)vs.DOM plots 65 and 66. Transmission drop outs occurred at 45 and 104 MHz on 19 and 20 October and very briefly at 104 MHz on 23 October. Drop outs on 29-30 October appear to be receiver system malfunctions.

**10.2.2 Noise and Meteor Shower**

Depressions in AR and DC are the consequence of reduced detectability of low level trail signals immersed in the higher noise floor. Effects of the higher frequency noise storm of 7-13 August (plot 116) can be seen in AR(SNR)vs.DOM, plot 30 and DC(SNR)vs.DOM, plots 65 and 66. These appear as a depression in AR and DC, especially at 104 MHz. A solar noise storm on 3 September is also indicated in plot 116. Effects are detectable, if not immediately obvious, in AR(SNR)vs.DOM, plot 30 and DC(SNR)vs.DOM, plots 65 and 66. Noise pedestals at 147 MHz in late September are unexplained.

The Perseid meteor shower of 11-12 August shows up as an increase at 104 MHz, in AR(RSL)vs.DOM in plots 25-27 and 30; DC(RSL)vs.DOM in plots 55-57 and DC(SNR)vs.DOM in plots 65 and 66. It is interesting to note that the impact of showers is most noticable at high frequencies and with high discrimination thresholds. Perseid shower effects at lower frequencies may be masked by the PCA onset. Meteor shower effects are included in the monthly average statistics.

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* System outages that occur during natural disturbances also seriously complicate the analysis of meteor scatter performance during such events. No such analyses are attempted in this bulletin.

** Plots 115 exclude power data during PCA events, indicating that these periods are excluded from monthly averages analysis. For analysis of event impacts, power outage data can be crucial.

**Table 3.** Outline of plot groups by Plot No., Showing Ordinate and Abscissa Data and the Group Screening Parameters.

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**PLOTS # 1-18**
ARRIVAL RATE (M/min) vs. Time-Of-Day (UT)
Comparing propagation modes; Underdense, Overdense, and All Trails.
Screening parameters; RSL threshold -126, -116, -106 dBm and Link frequencies 35, 45, 65, 85, 104, and 147 MHz.

**PLOTS # 19-24**
ARRIVAL RATE (M/min) vs. Threshold RSL in dBm
Comparing propagation modes; Underdense, Overdense, and All Trails.
Screening parameters; Link frequencies 35, 45, 65, 85, 104, and 147 MHz. averaged over 24 hours.

**PLOTS # 25-27**
ARRIVAL RATE (M/min) vs. DAY/Time-Of-Day (UT)
Comparing link Frequencies; 45 and 104 MHz.
Screening parameters; RSL threshold -126, -116, -106 dBm

**PLOT # 28**
ARRIVAL RATE (M/min) vs. Time-Of-Day (UT)
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All trails, 19 dB SNR threshold.

**PLOT # 29**
ARRIVAL RATE (M/min) vs. Threshold SNR in dB
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All trails, 24 hour average.

**PLOT # 30**
ARRIVAL RATE (M/min) vs. DAY/Time Of Day (UT)
Comparing link Frequencies; 45 and 104 MHz.
Screening parameters; All trails, 19 dB SNR threshold.

**PLOTS # 31-36**
DUTY CYCLE ABOVE RSL (percent) vs. Threshold RSL in dBm
Comparing propagation modes; Underdense, Overdense, and All Trails, also Sporadic E and All Events.
Screening parameters; Link frequencies 35, 45, 65, 85, 104, and 147 MHz. averaged over 24 hours.

**PLOTS # 37-54**
DUTY CYCLE ABOVE RSL (percent) vs. Time-Of-Day (UT)
Comparing propagation modes; Underdense, Overdense, and All Trails, also Sporadic E and All Events.
Screening parameters; RSL threshold -126, -116, -106 dBm, and Link frequencies 35, 45, 65, 85, 104, and 147 MHz.

**PLOTS # 55-57**
DUTY CYCLE ABOVE RSL (percent) vs. DAY/Time-Of-Day (UT)
Comparing link Frequencies; 45 and 104 MHz

**Table 3.** Outline of plot groups; continued.

**PLOTS # 58-60**
DUTY CYCLE ABOVE RSL (percent) vs. DAY/Time-Of-Day (UT)
Comparing link Frequencies; 45 and 104 MHz.
Screening parameters; RSL threshold -126, -116, -106 dBm, for Sporadic E-layers only.

**PLOTS # 61,62**
DUTY CYCLE ABOVE SNR (percent) vs. SNR (dB)
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All-Trails and All-Events including Sporadic E-layers, 24 hour average.

**PLOTS # 63,64**
DUTY CYCLE ABOVE SNR (percent) vs. Time-Of-Day (UT)
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All Trails and All-Events including Sporadic E-layers, 19 dB SNR threshold.

**PLOTS # 65,66**
DUTY CYCLE ABOVE SNR (percent) vs. DAY/Time-Of-Day (UT)
Comparing link Frequencies; 45 and 104 MHz.
Screening parameters; All Trails and All-Events including Sporadic E-layers, 19 dB SNR threshold.

**PLOTS # 67-84**
NORMAL DISTRIBUTION vs. DURATION
Comparing propagation modes; Underdense, Overdense, and All Trails, also sporadic-E and All-Events.
Screening parameters; RSL threshold -126, -116, -106 dBm, and Link frequencies 35, 45, 65, 85, 104, and 147 MHz.

**PLOTS # 85-87**
NORMAL DISTRIBUTION vs. DURATION
Comparing link Frequencys; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; RSL threshold -126, -116, -106 dBm, for All Trails.

**PLOTS # 88-93**
AVERAGE TRAIL DURATION vs. RSL
Comparing propagation modes; Underdense, Overdense, and All Trails, also Sporadic E and All Events.
Screening parameters; Link frequencies 35, 45, 65, 85, 104, and 147 MHz. averaged over 24 hours.

**PLOTS # 94,95**
NORMAL DISTRIBUTION vs. DURATION
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; 24 hour average, 19 dB SNR threshold, for All-Trails and All-Events including Sporadic E-layers.

**Table 3.** Outline of plot groups; continued.

PLOTS # 96,97
AVERAGE TRAIL DURATION vs. SNR
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All trails, 24 hour average.

PLOT # 98
NORMAL DISTRIBUTION, UNDERDENSE DECAY CONSTANTS
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
24 hour average.

PLOT # 99
AVERAGE UNDERDENSE DECAY CONSTANT vs. Time-Of-Day (UT)
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.

PLOT # 100
NORMAL DISTRIBUTION, FADES/SEC
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All trails, 24 hour average.

PLOTS # 101-106
NORMAL DISTRIBUTION, FADES/SEC
Comparing propagation modes; Underdense, Overdense,and All Trails, also Sporadic E and All Events.
Screening parameters; Link frequencies 35, 45, 65, 85, 104, and 147 MHz. averaged over 24 hours.

PLOT # 107
AVERAGE FADES/SEC. vs. Time-Of-Day (UT)
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
All trails.

PLOT # 108
NORMAL DISTRIBUTION, FADE DURATIONS
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Screening parameters; All trails, 24 hour average.

PLOTS # 109-114
NORMAL DISTRIBUTION, FADE DURATIONS
Comparing propagation modes; Underdense, Overdense,and All Trails, also Sporadic E and All Events.
Screening parameters; Link frequencies 35, 45, 65, 85, 104, and 147 MHz. averaged over 24 hours.

PLOT # 115
LINK-AVAILABILITY/POWER vs. DAY/Time-Of-Day (UT)
Indicating transmitter power during valid, benign, data periods.
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.
Periods of extraordinary disturbance are blanked out.

Table 3. Outline of plot groups; continued.

**PLOT # 116**
NOISE-TEMPERATURE (Kelvin) vs. DAY/Time-Of-Day (UT)
Comparing link Frequencies; 35, 45, 65, 85, 104, and 147 MHz.

**PLOTS # 117-120**
30 MHz RIOMETER DATA vs. DAY/Time-Of-Day
Two riometers are maintained at Thule AB. Direct riometer receiver outputs in volts, PLOTS 117 and 119, show the diurnal variation in absorption thoughout the month. PLOTS 118 and 120 display riometer absorption data in dB with the quiet day diurnal variation removed.

**PLOTS # 121-123**
3-AXIS MAGNETOMETER vs. DAY/Time-Of-Day. Data from a 3-axis fluxgate magnetometer at Thule AB. The X axis is aligned with magnetic-North pole.

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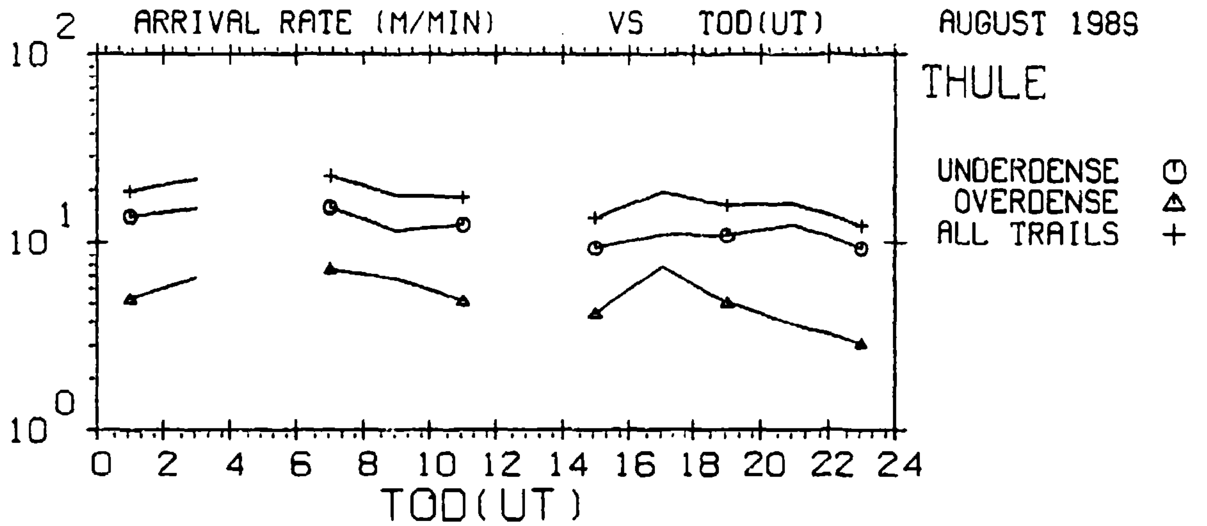
# APPENDIX A

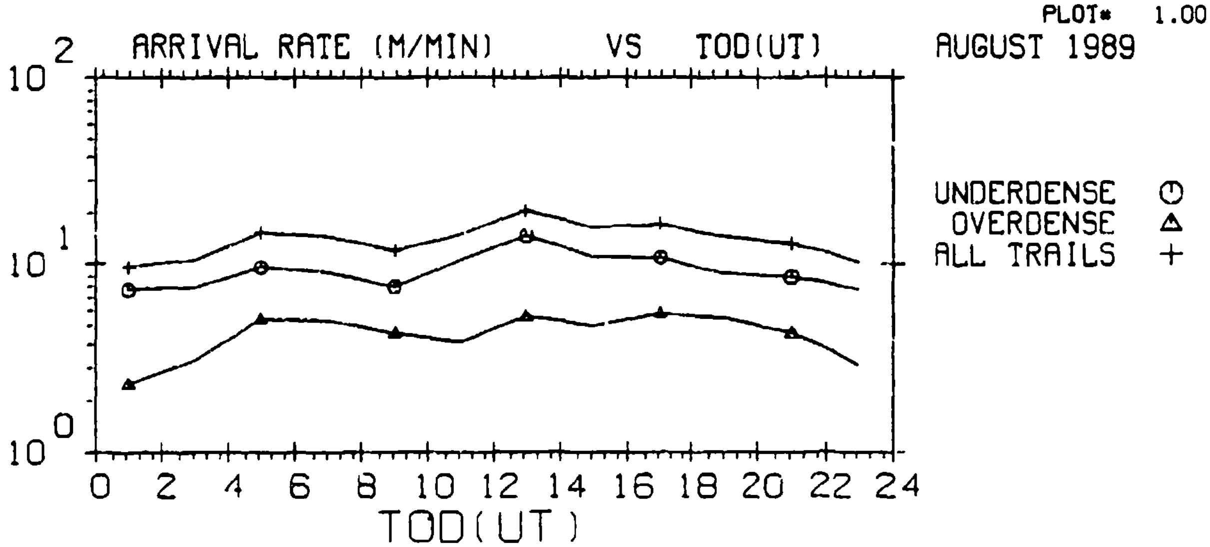
## STATISTICS FOR AUGUST 1989

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

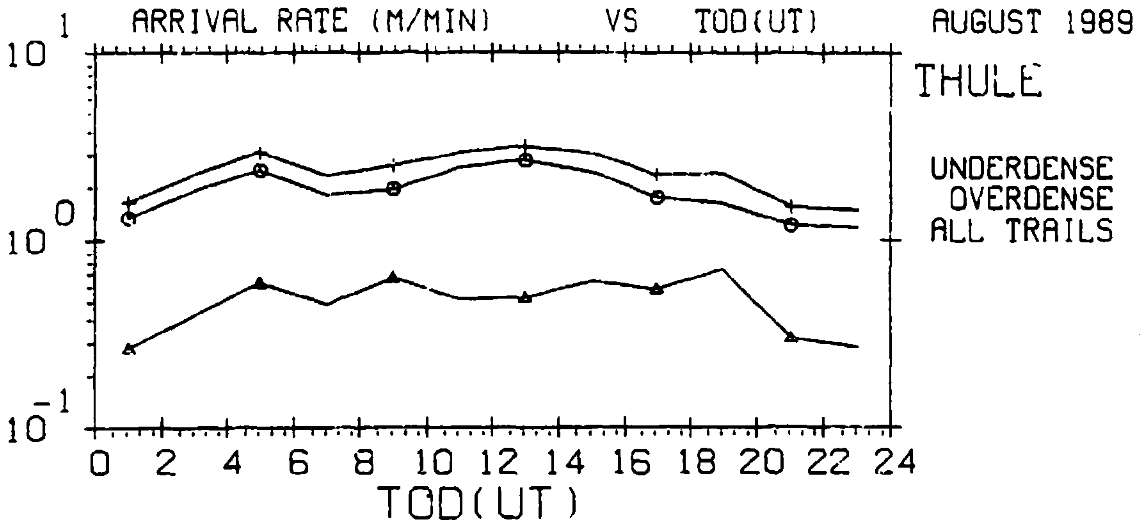
MENU*101,05-2
20-APR-93
PLOT* 1.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

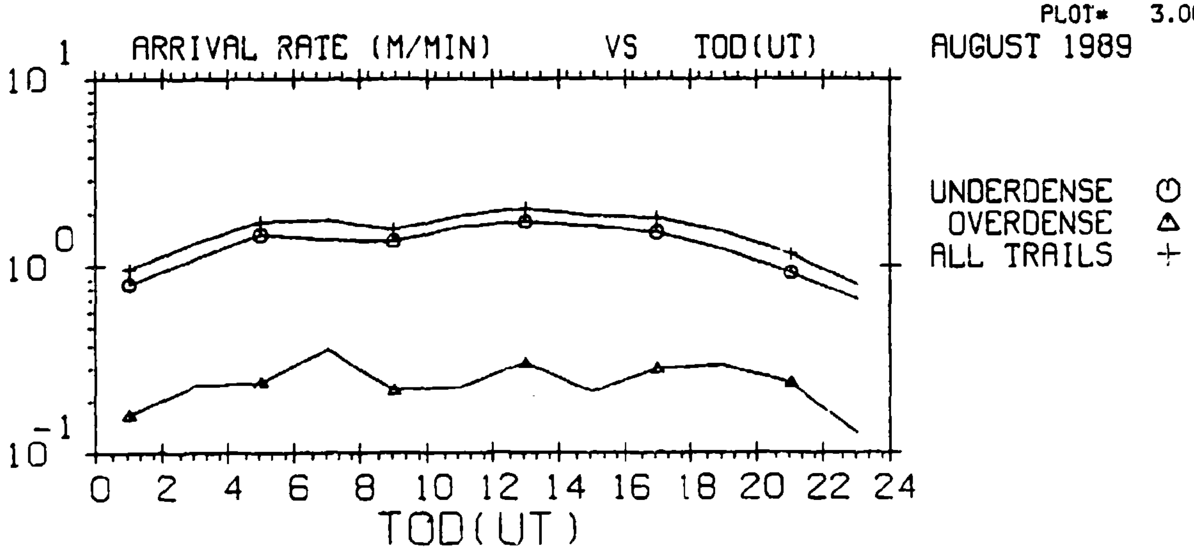
MENU*101,05-2
20-APR-93
PLOT* 2.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

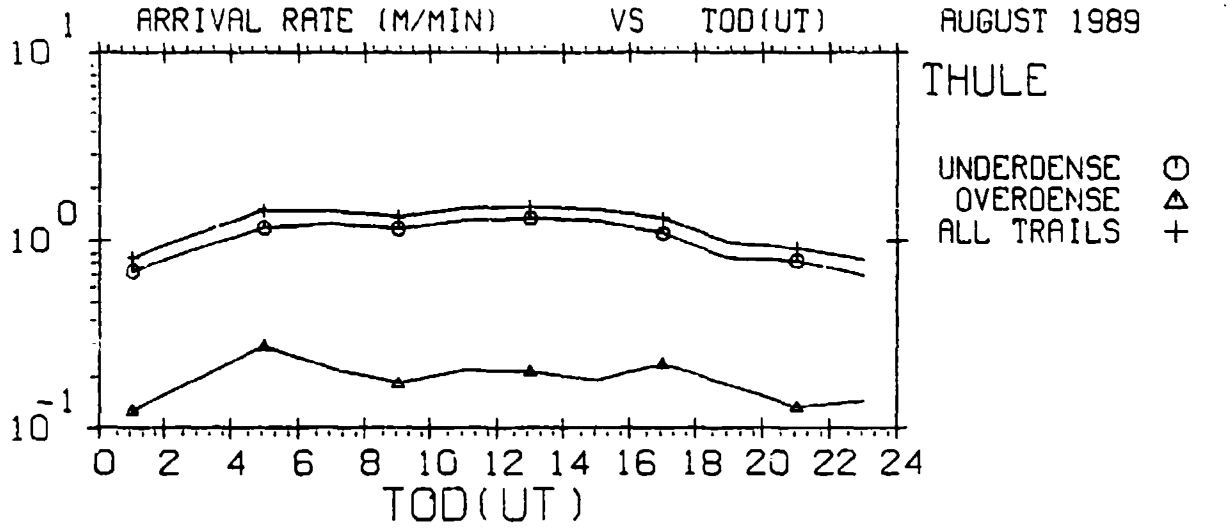
MENU*101,05-2
20-APR-93
PLOT* 3.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

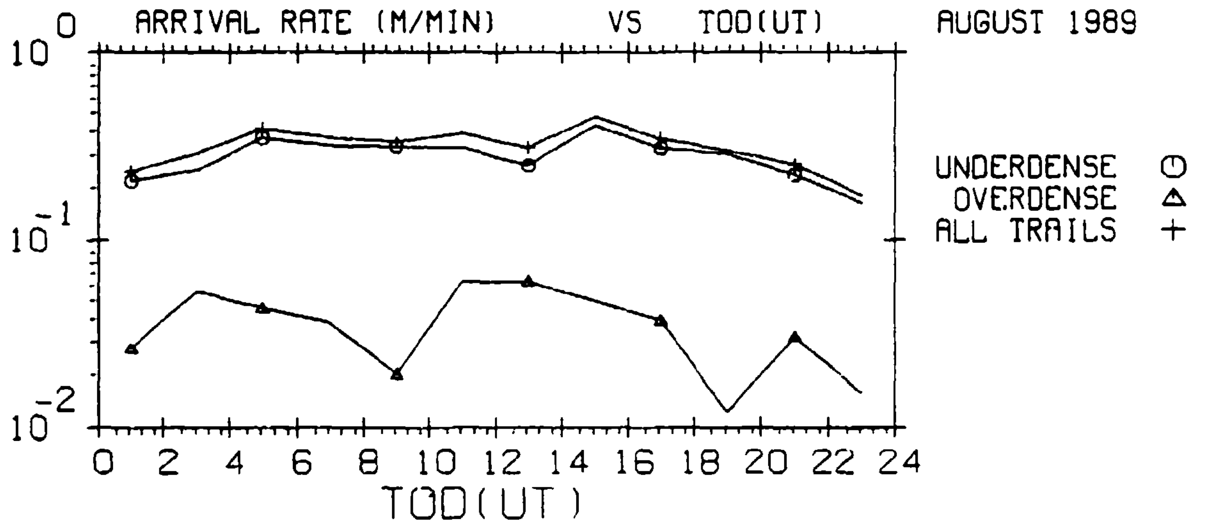
MENU*101,05-2
20-APR-93
PLOT* 4.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

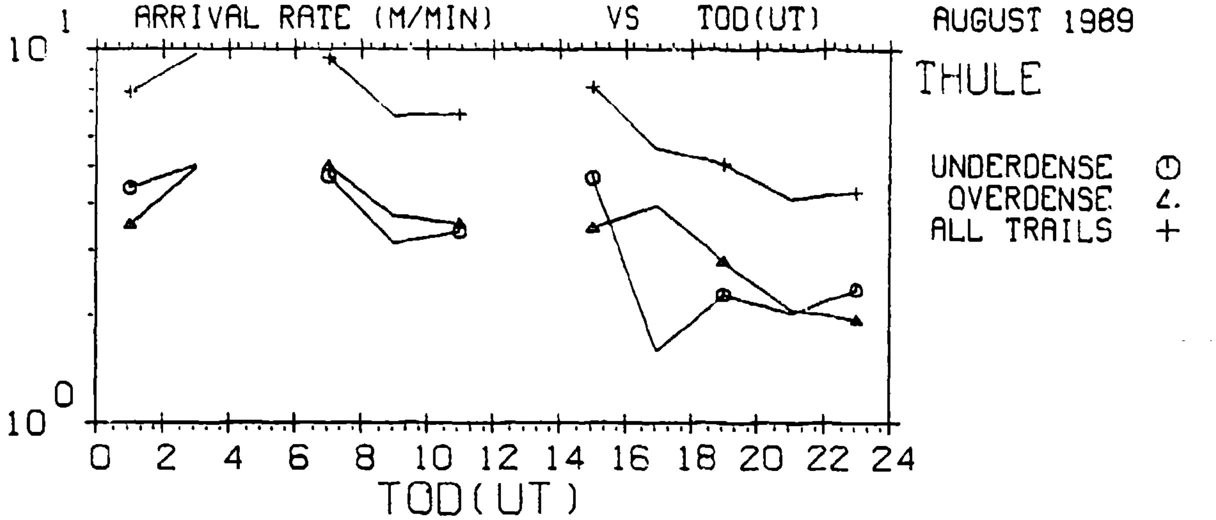
MENU=101,05-2
20-APR-93
PLOT= 5.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

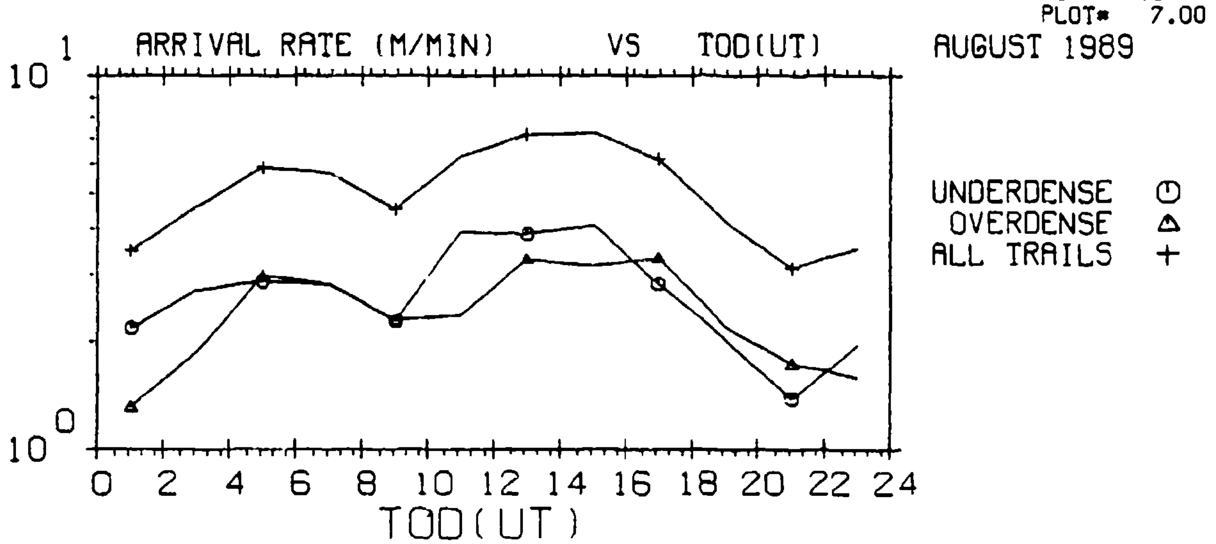
MENU=101,05-2
20-APR-93
PLOT= 6.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

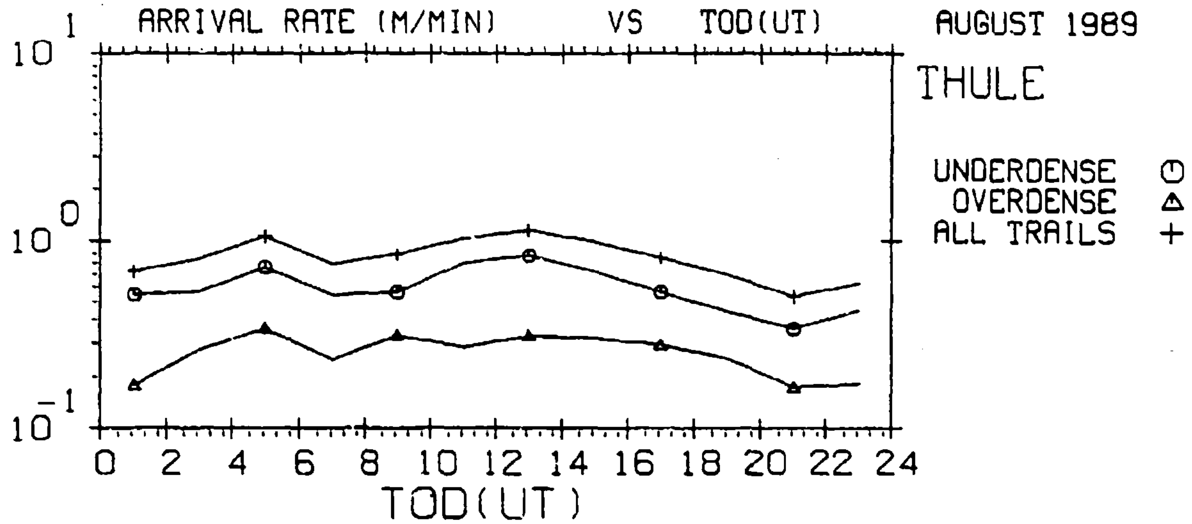
MENU=101,05-2
20-APR-93
PLOT= 7.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

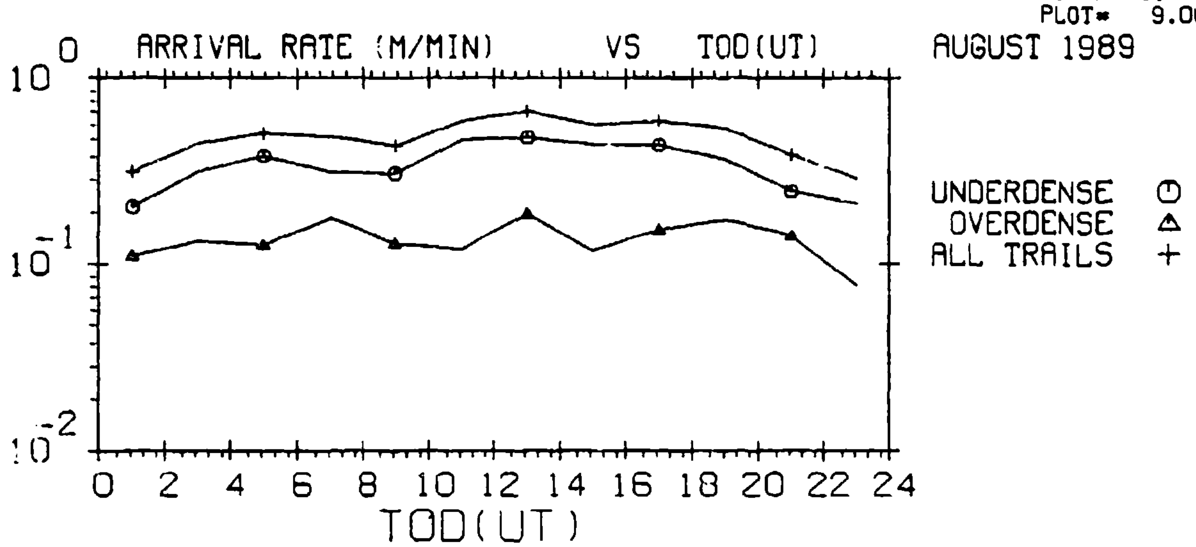
MENU=101,05-2
20-APR-93
PLOT= 8.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

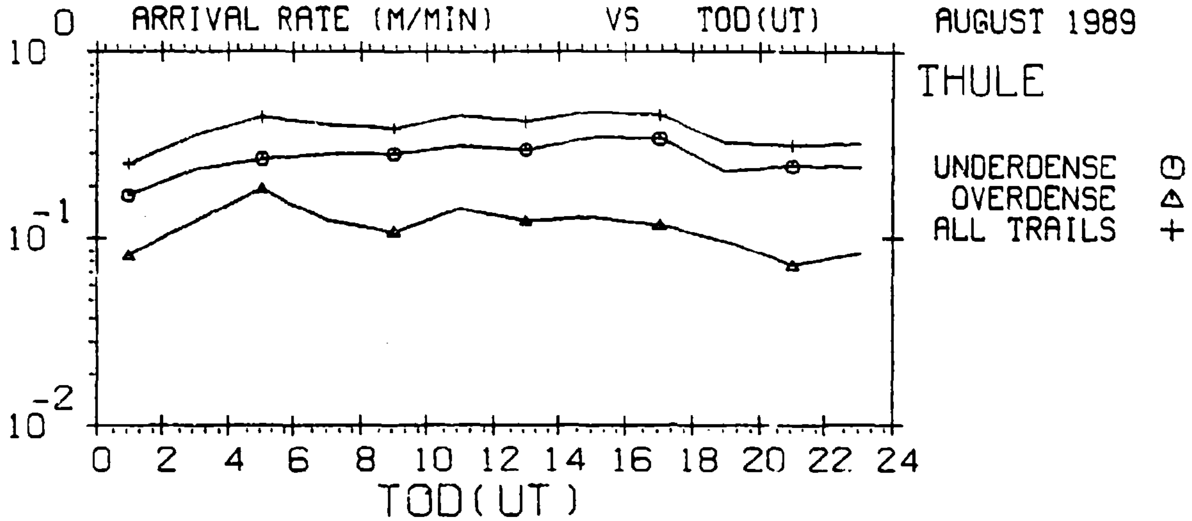
MENU*101,05-2
20-APR-93
PLOT* 9.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

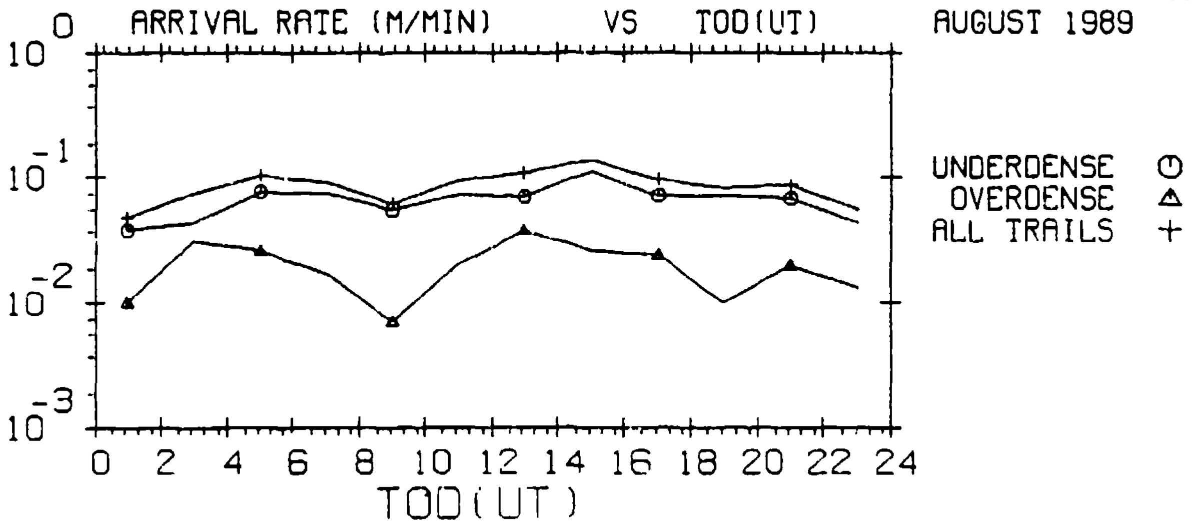
MENU*101,05-2
20-APR-93
PLOT* 10.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

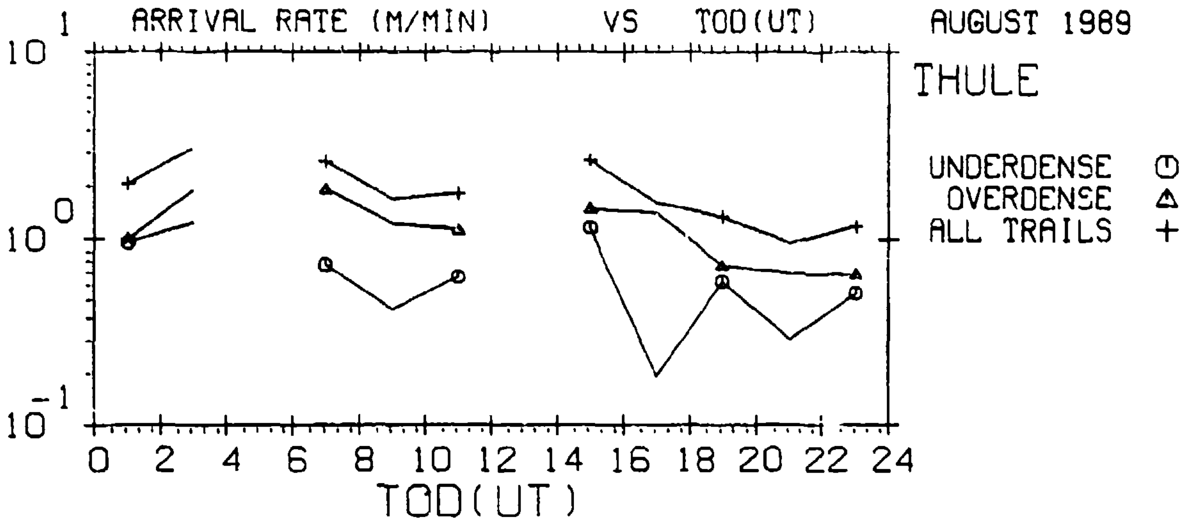
MENU=101,05-2
20-APR-93
PLOT= 11.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

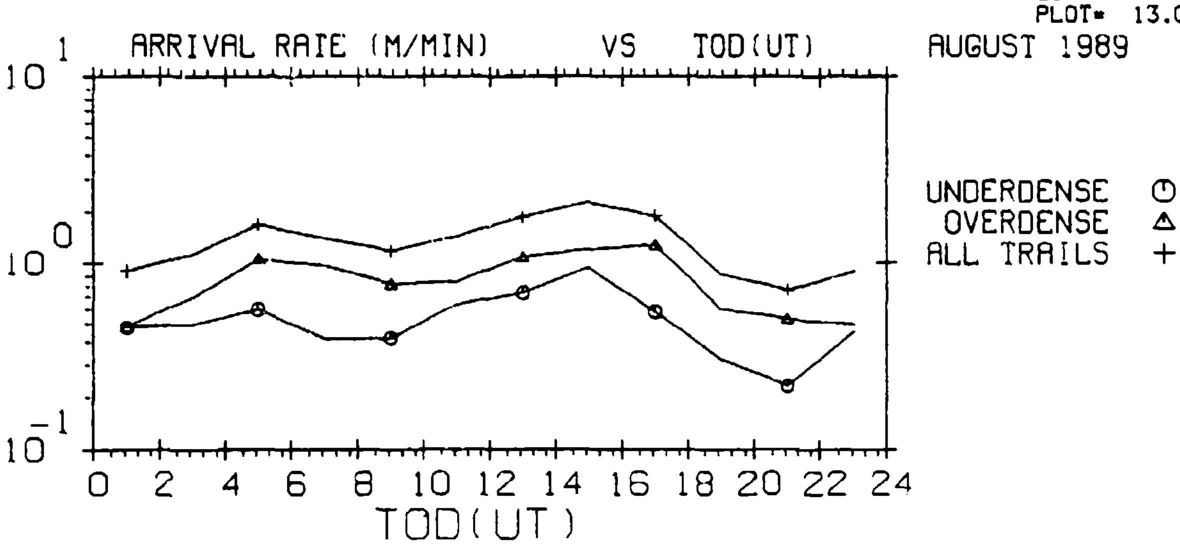
MENU=101,05-2
20-APR-93
PLOT= 12.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

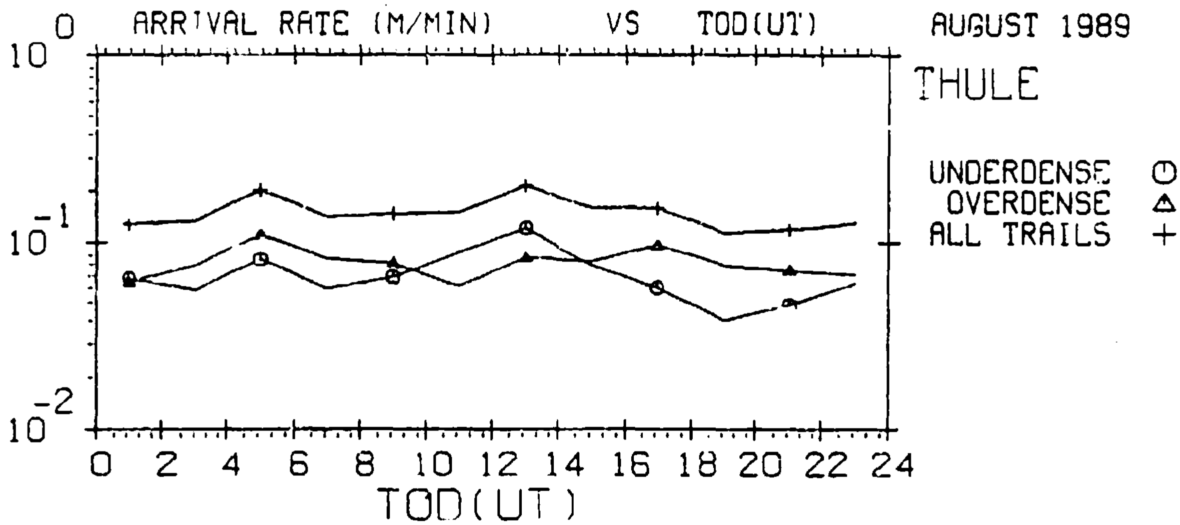
MENU=101,05-2
20-APR-93
PLOT= 13.00




EXCEEDING -106.0 DBM RSL
FRECUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

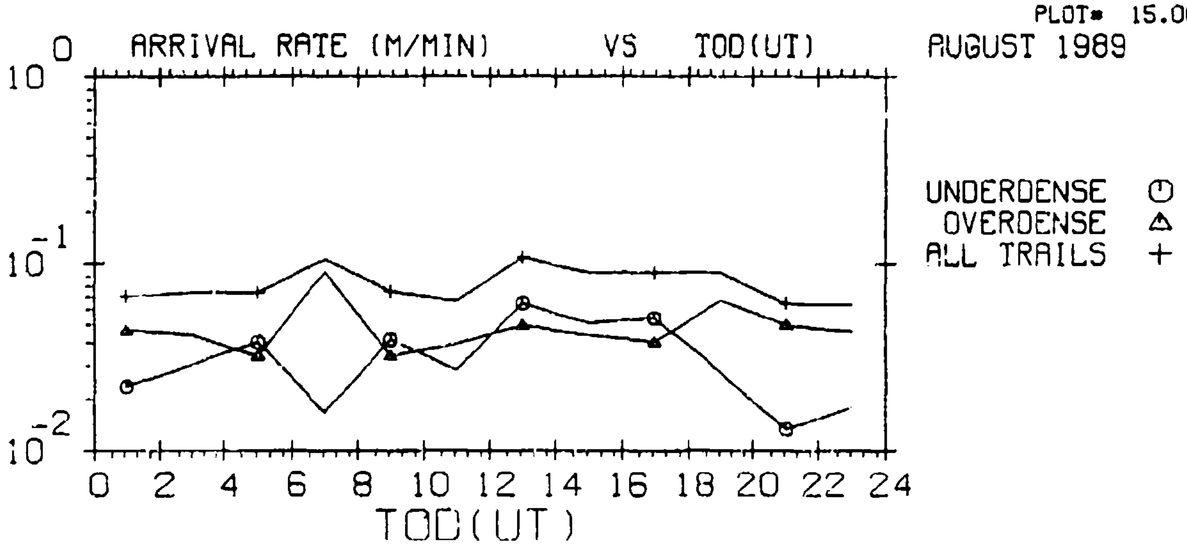
MENU=101,05-2
20-APR-93
PLOT= 14.00

G[illegible]YSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

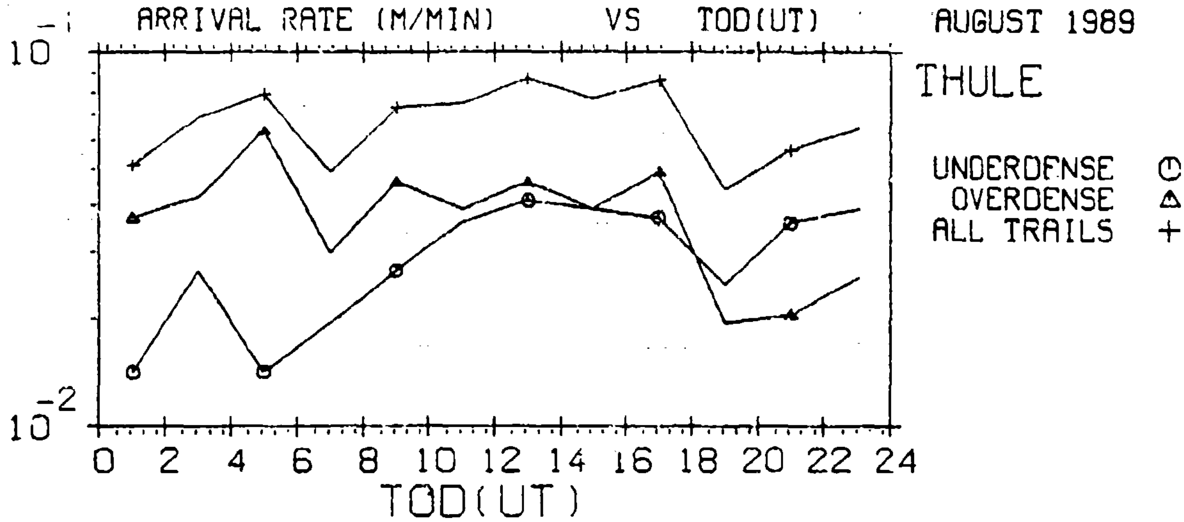
MENU=101,05-2
20-APR-93
PLOT= 15.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

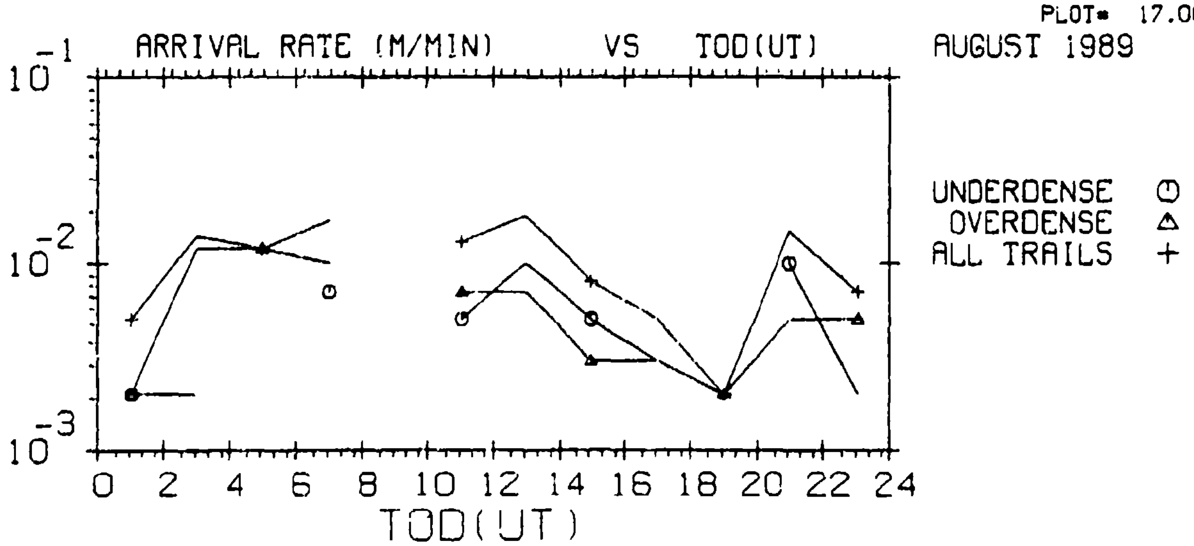
MENU=101,05-2
20-APR-93
PLOT= 16.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

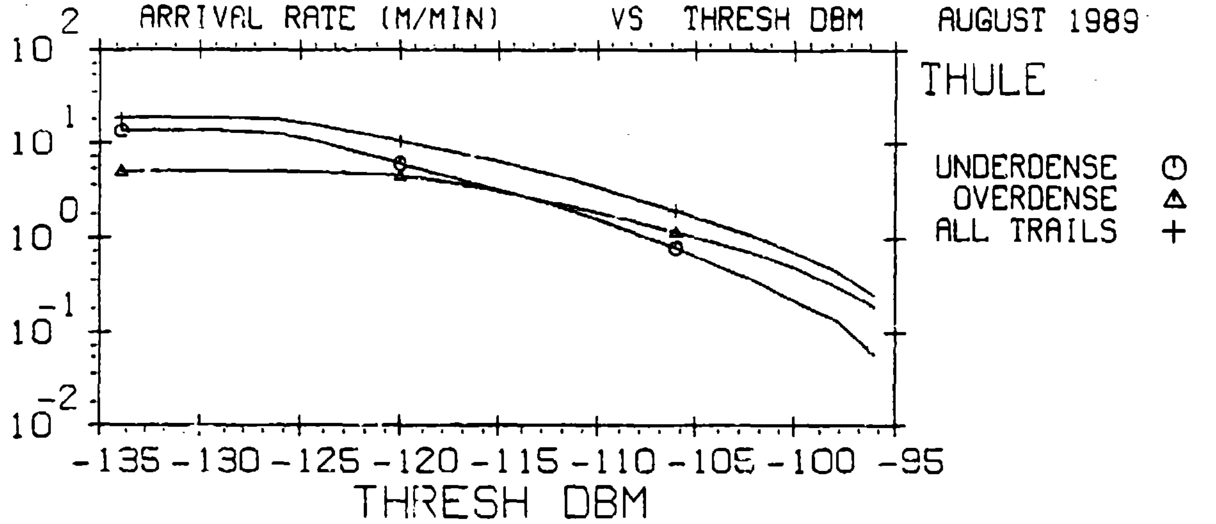
MENU=101,05-2
20-APR-93
PLOT= 17.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

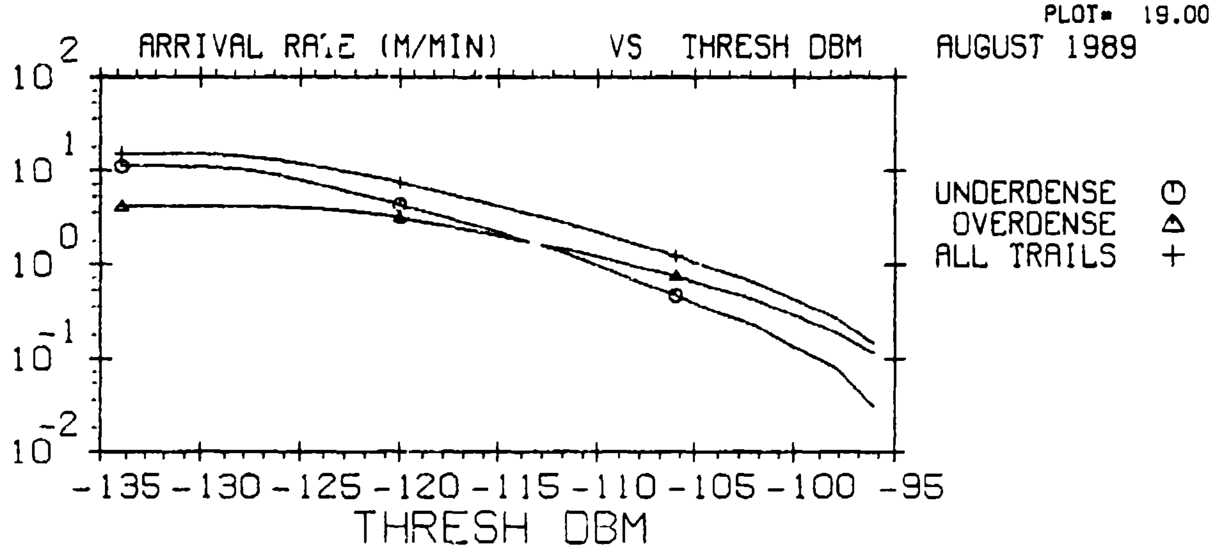
MENU=101,05-2
20-APR-93
PLOT= 18.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

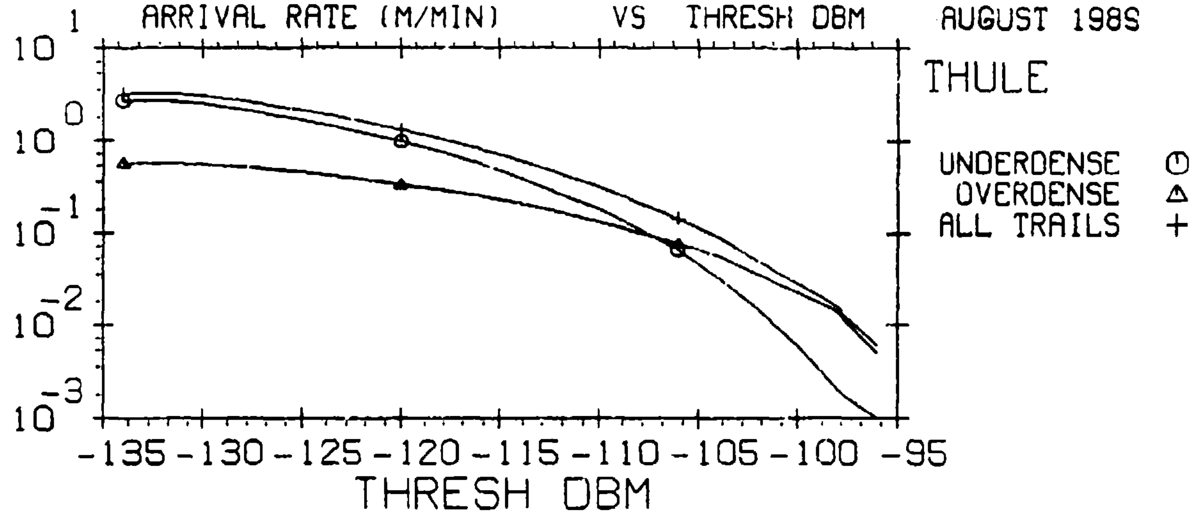
MENU=101,06-2
20-APR-93
PLOT= 19.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

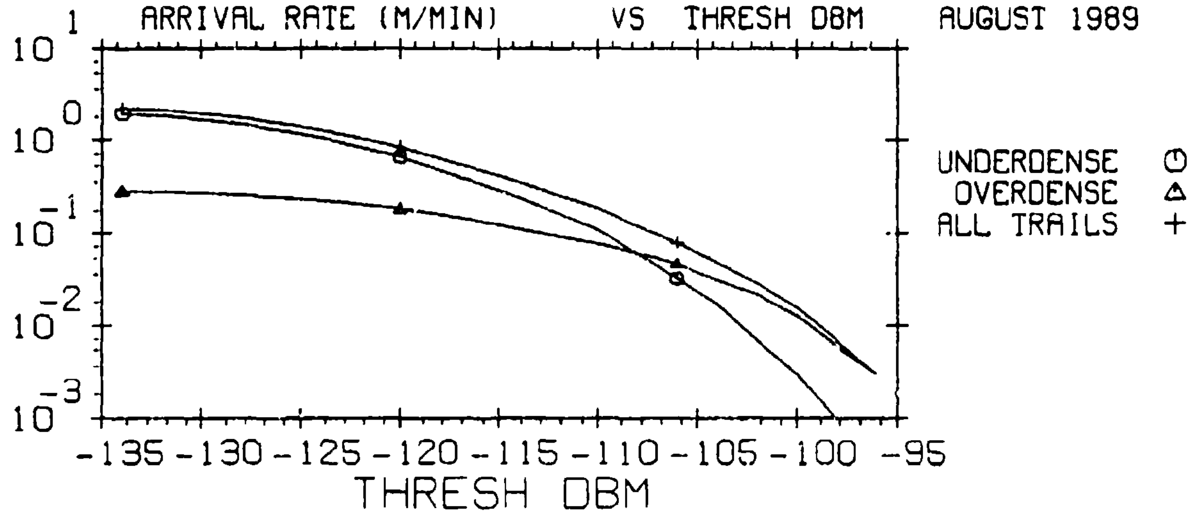
MENU=101,06-2
20-APR-93
PLOT= 20.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

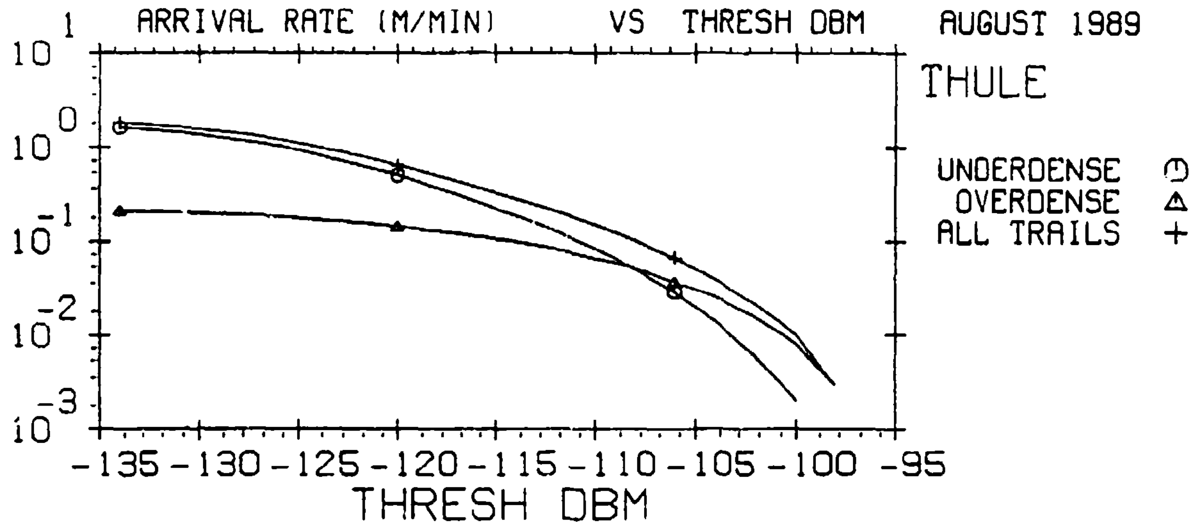
MENU=101,06-2
20-APR-93
PLOT= 21.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

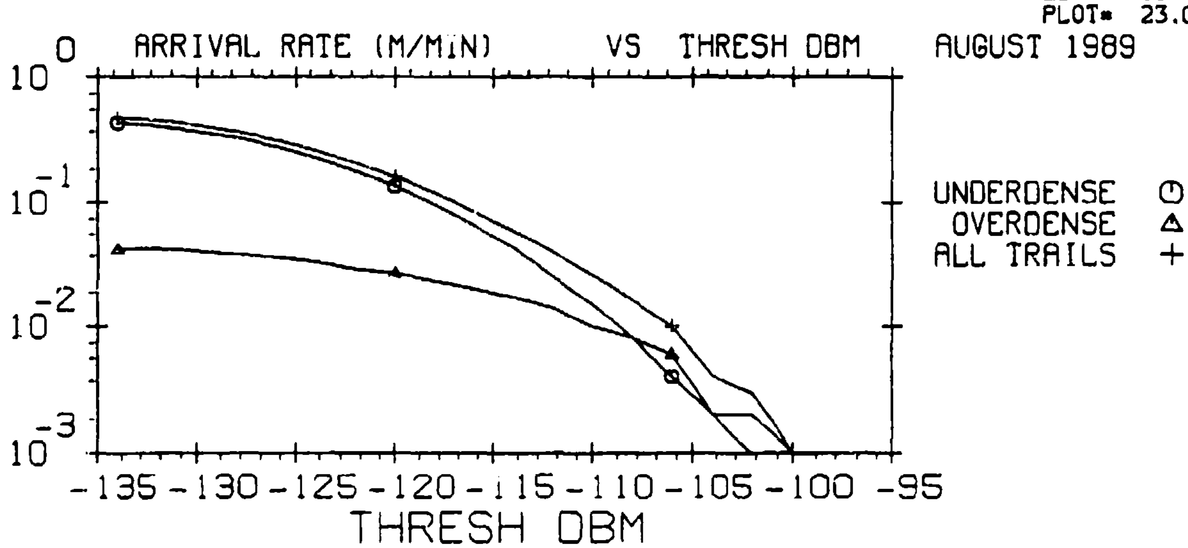
MENU=101,06-2
20-APR-93
PLOT= 22.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

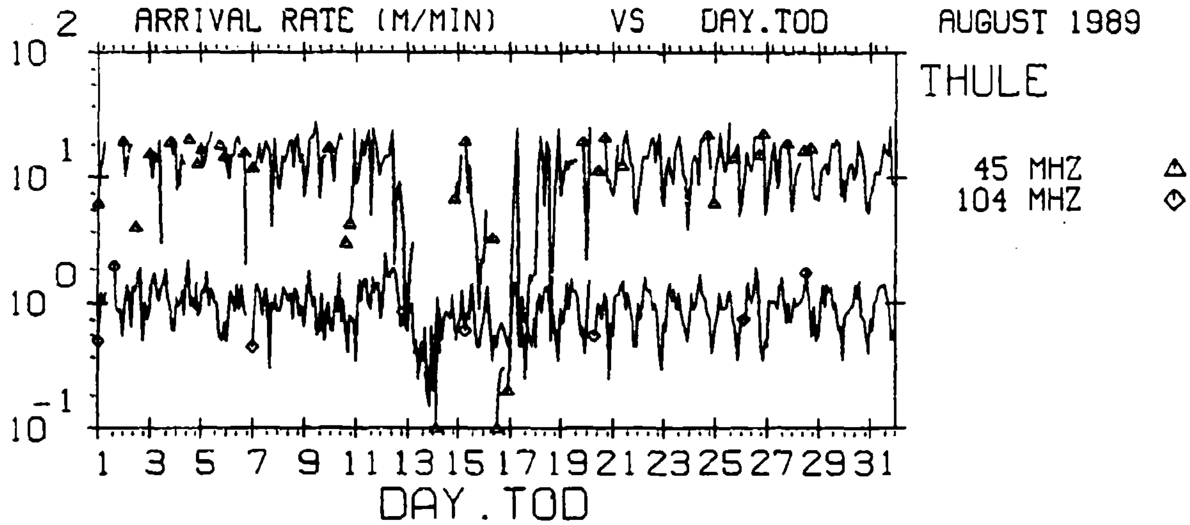
MENU=101,06-2
20-APR-93
PLOT= 23.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

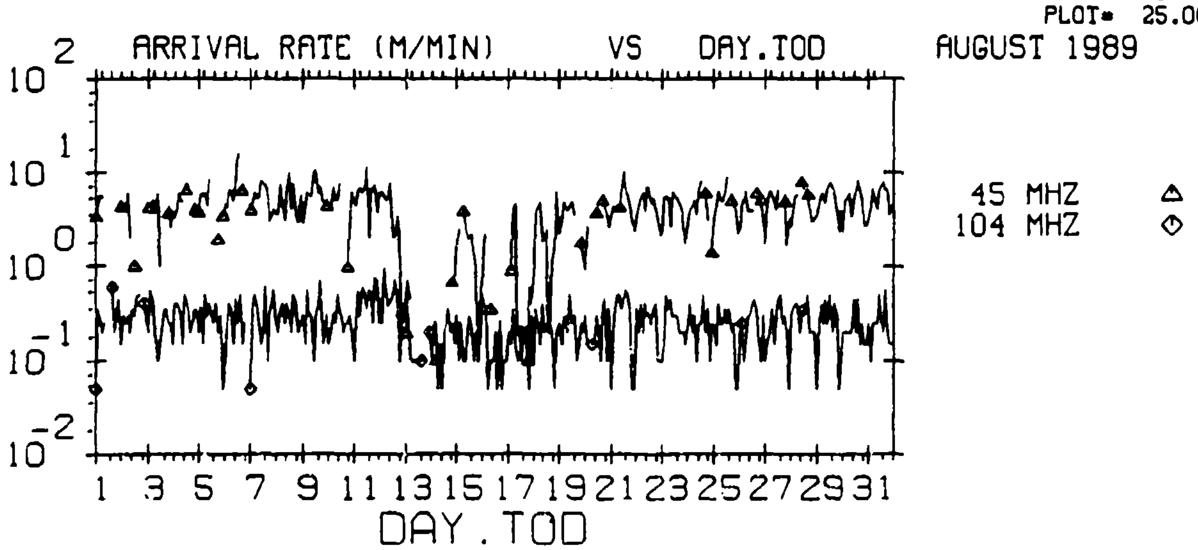
MENU=101,06-2
20-APR-93
PLOT= 24.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

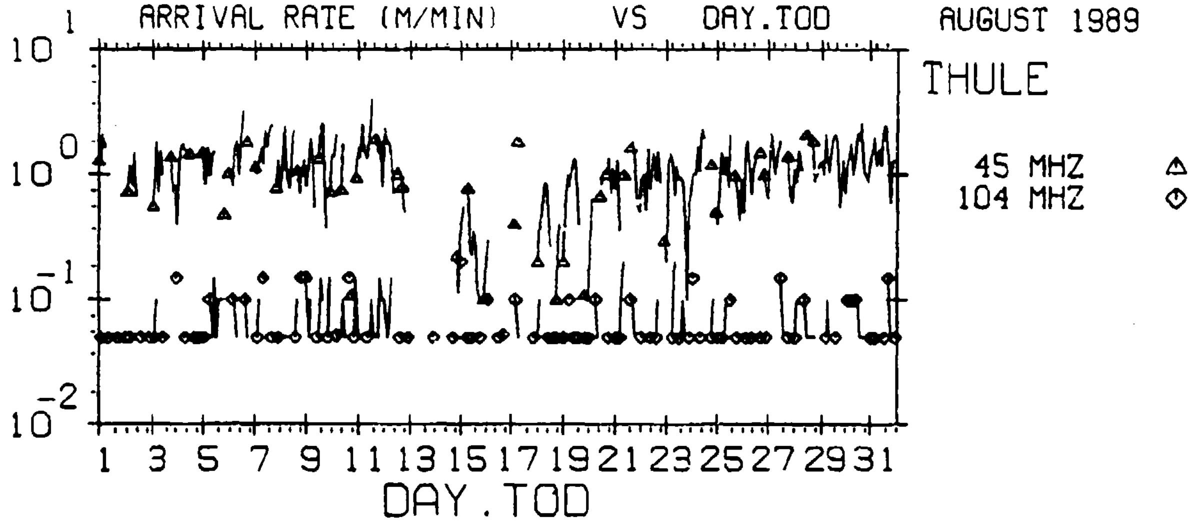
MENU=101,03-2
20-APR-93
PLOT= 25.00




EXCEEDING -116.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

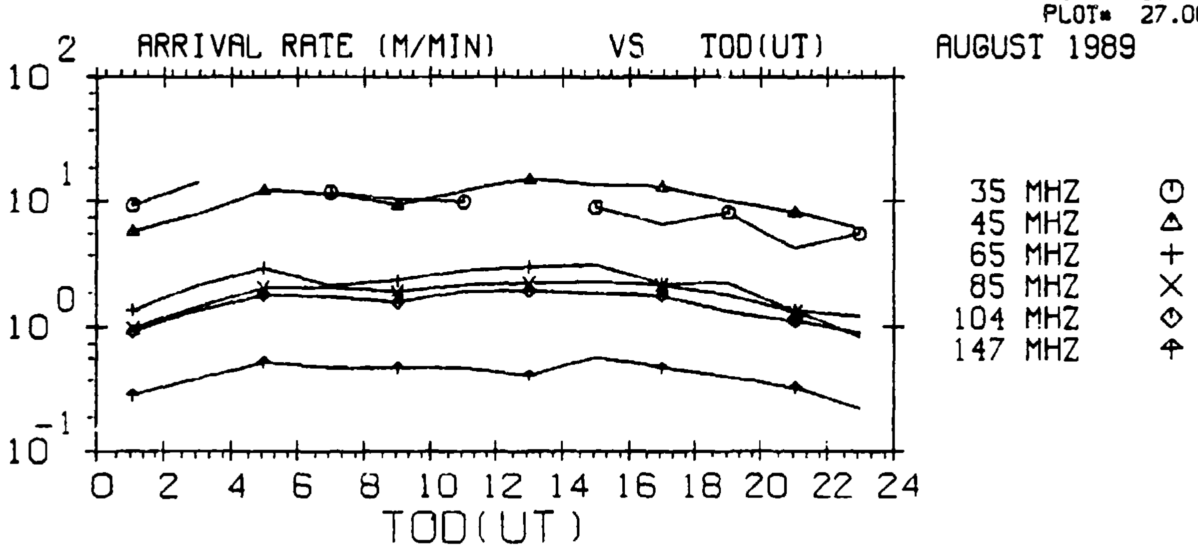
MENU=101,03-2
20-APR-93
PLOT= 26.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU=101,03-2
20-APR-93
PLOT= 27.00

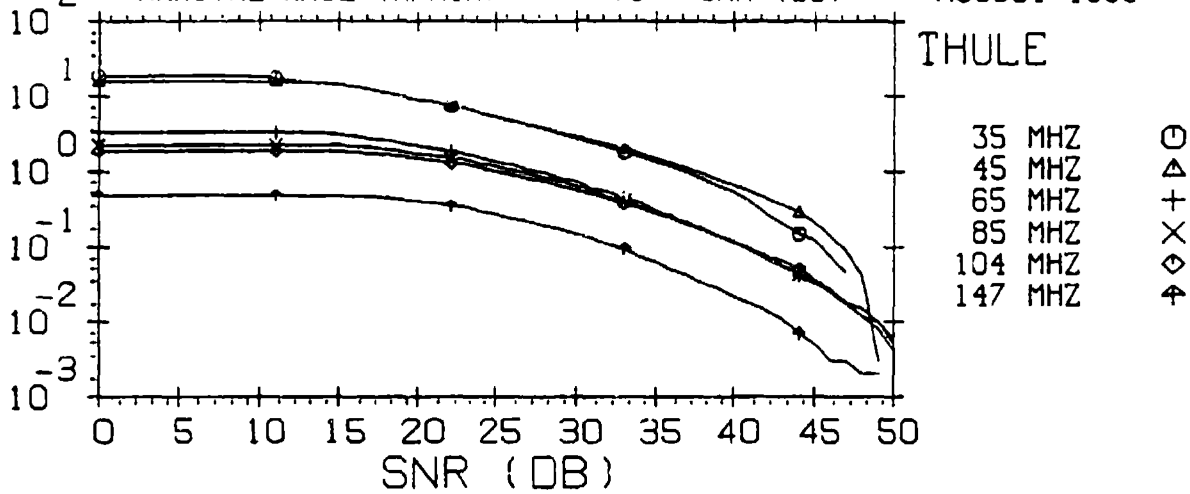



EXCEEDING 19.0 DB SNR
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU=102,01-2
20-APR-93
PLOT= 28.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

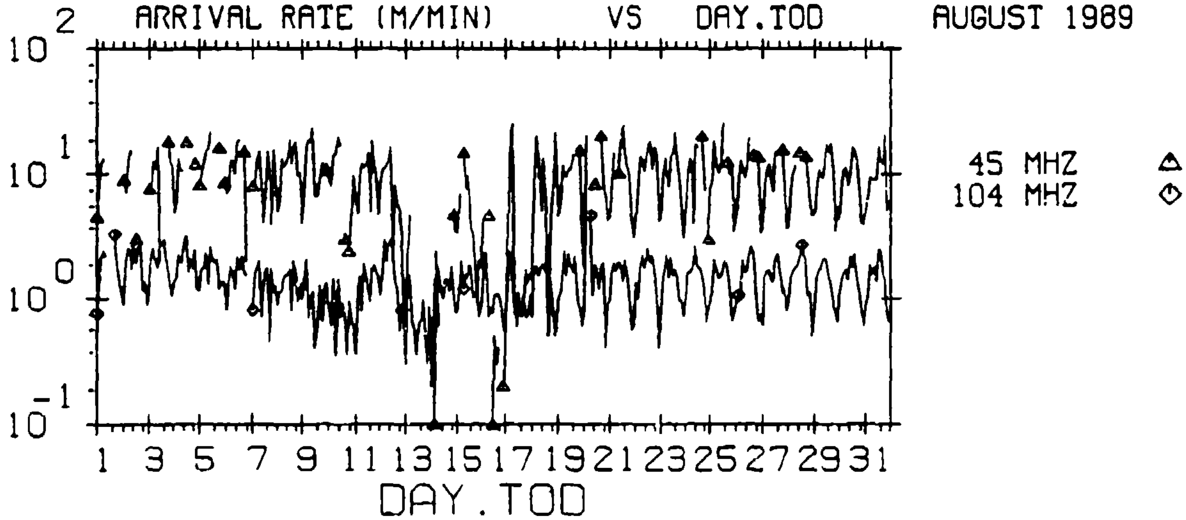
ARRIVAL RATE (M/MIN) VS SNR (DB) AUGUST 1989




THE TIME OF DAY IS 0 - 24 HOURS U.T.
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU=102,02-2
20-APR-93
PLOT= 29.00

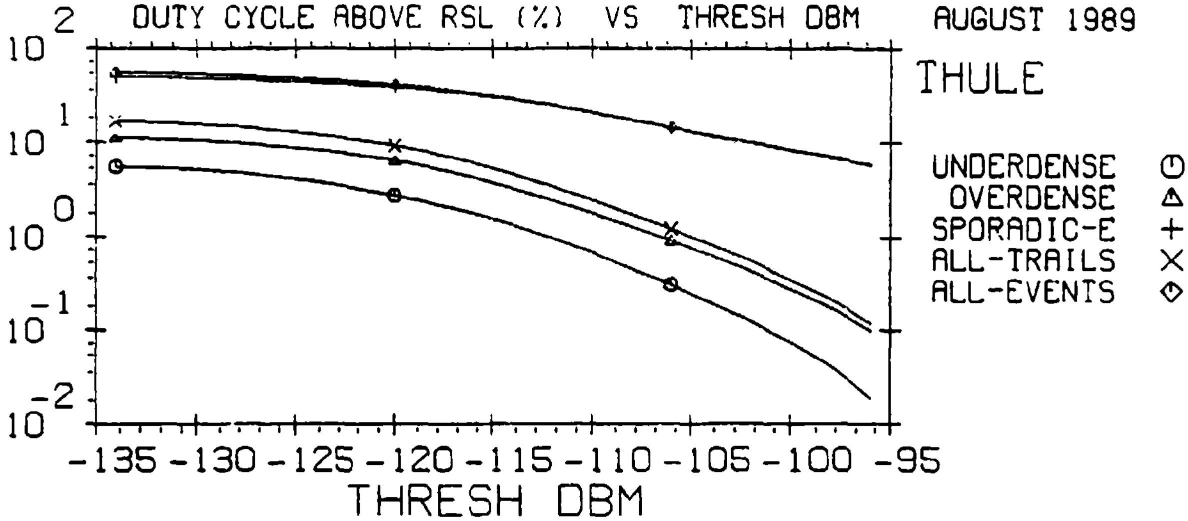
ARRIVAL RATE (M/MIN) VS DAY.TOD AUGUST 1989




EXCEEDING 19.0 DB SNR
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

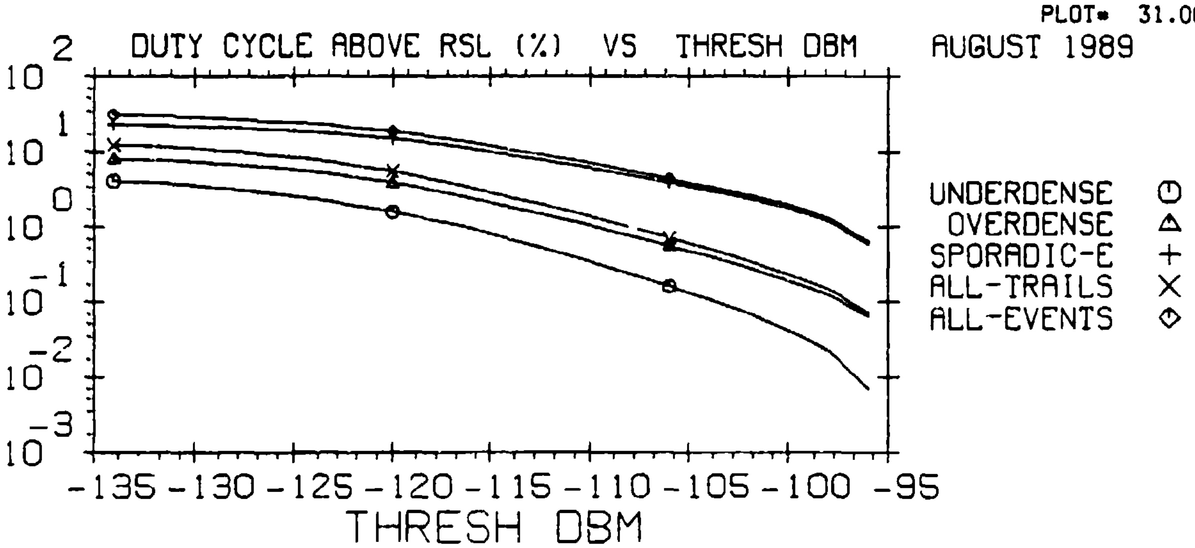
MENU=102,03-2
20-APR-93
PLOT= 30.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

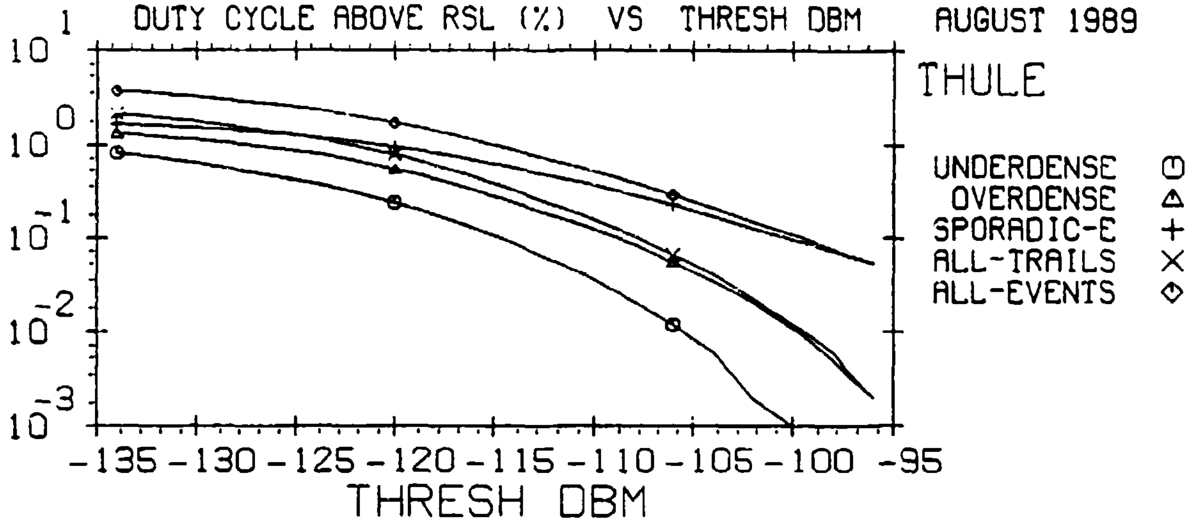
MENU* 103,06-2
20-APR-93
PLOT* 31.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

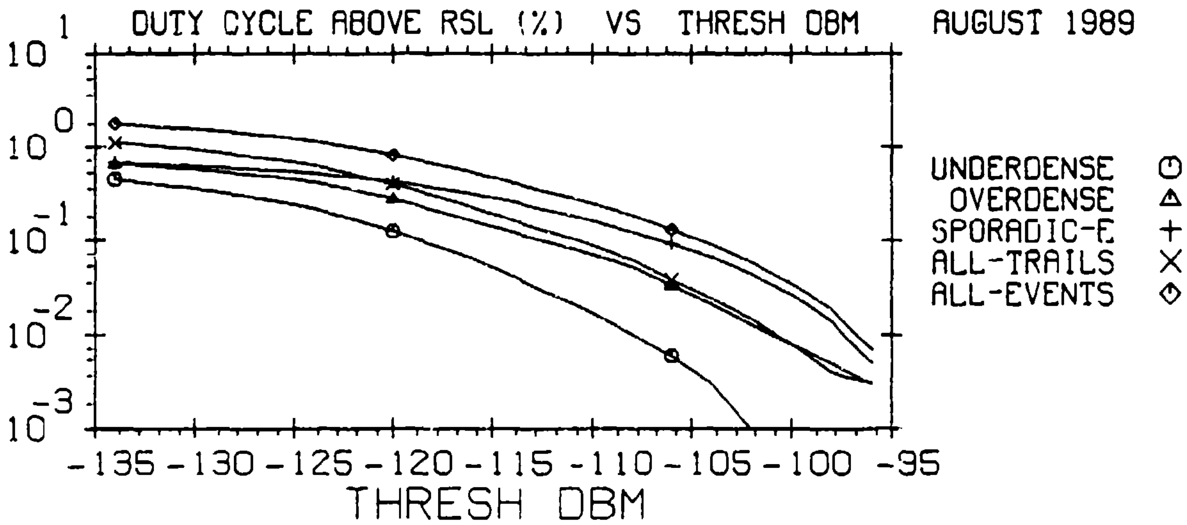
MENU* 103,06-2
20-APR-93
PLOT* 32.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

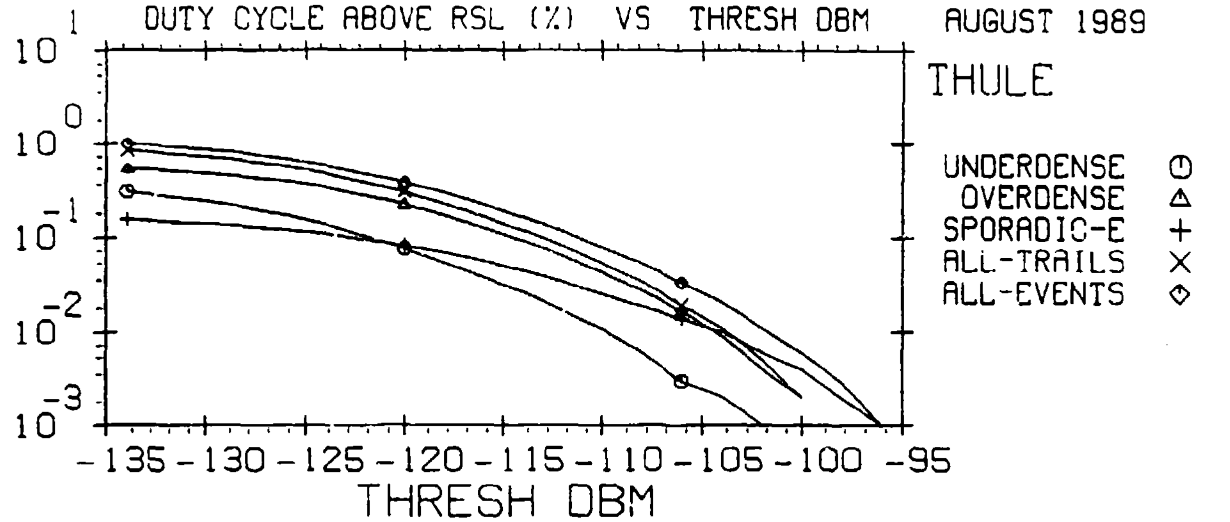
MENU=103,06-2
20-APR-93
PLOT= 33.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

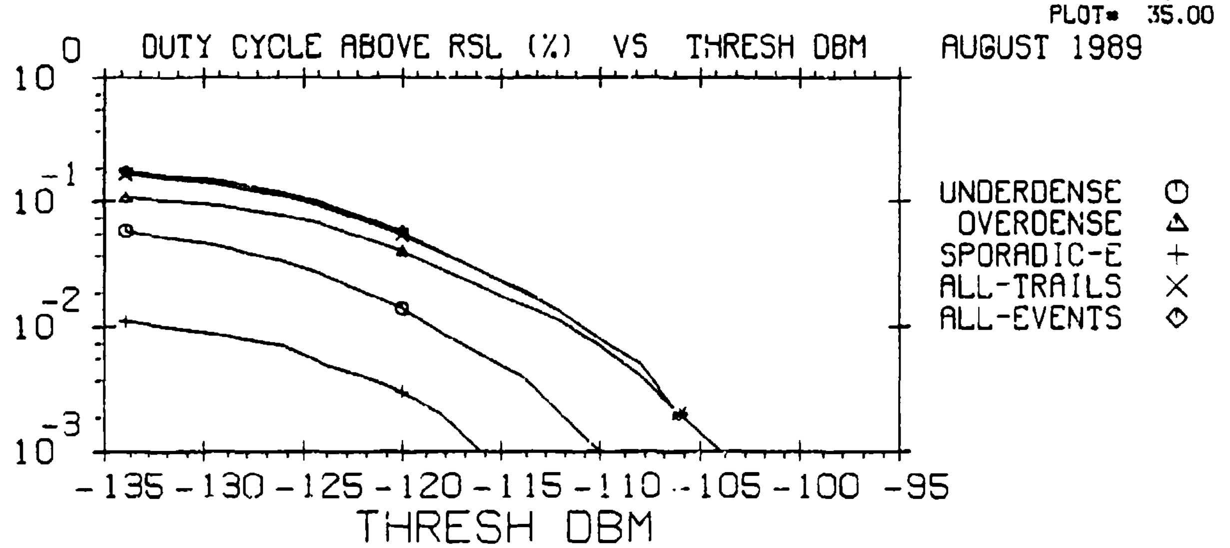
MENU=103,06-2
20-APR-93
PLOT= 34.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

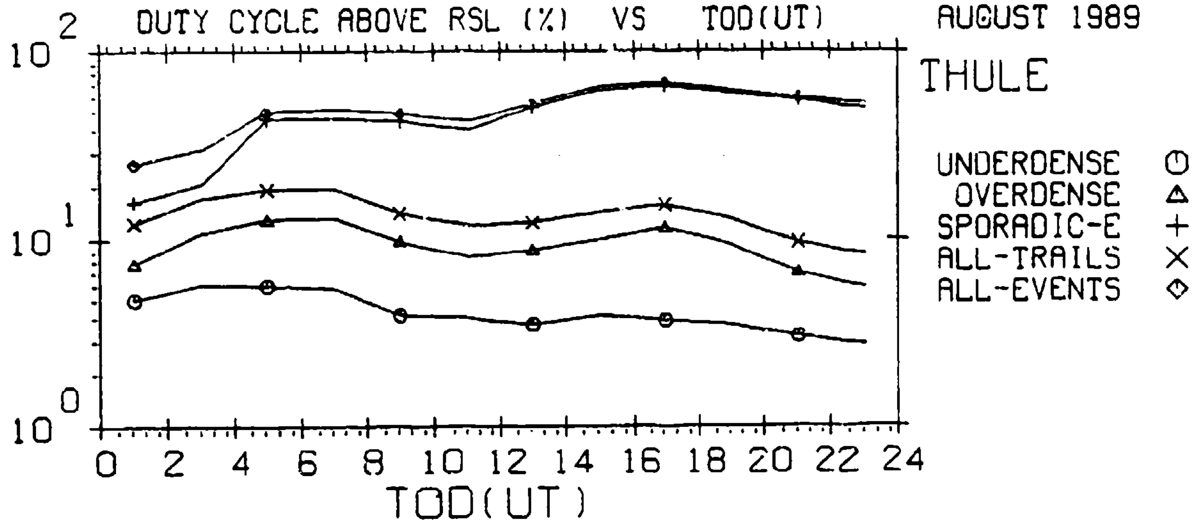
MENU=103,06-2
20-APR-93
PLOT= 35.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

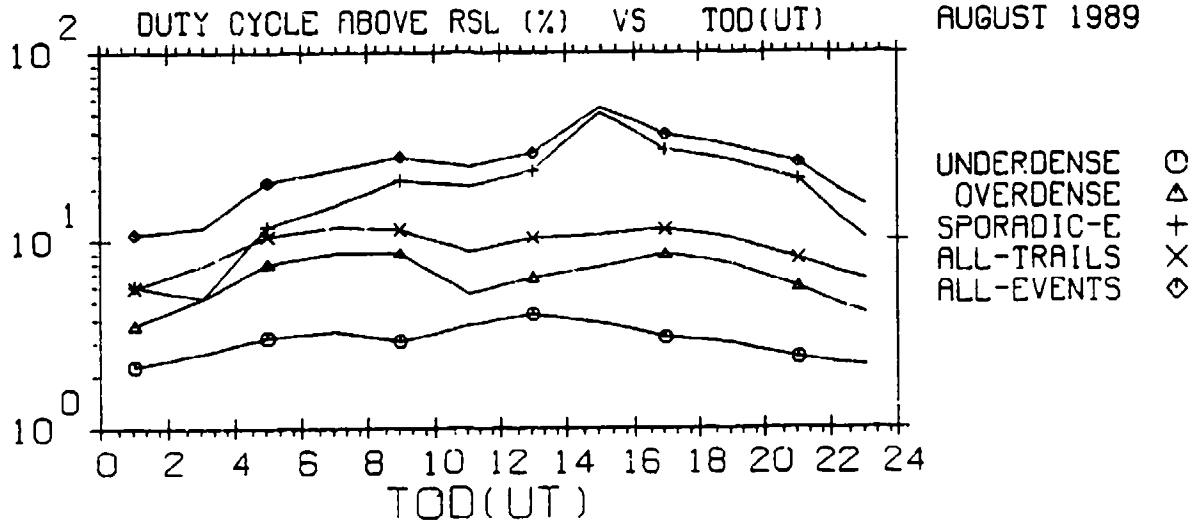
MENU=103,06-2
20-APR-93
PLOT= 36.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

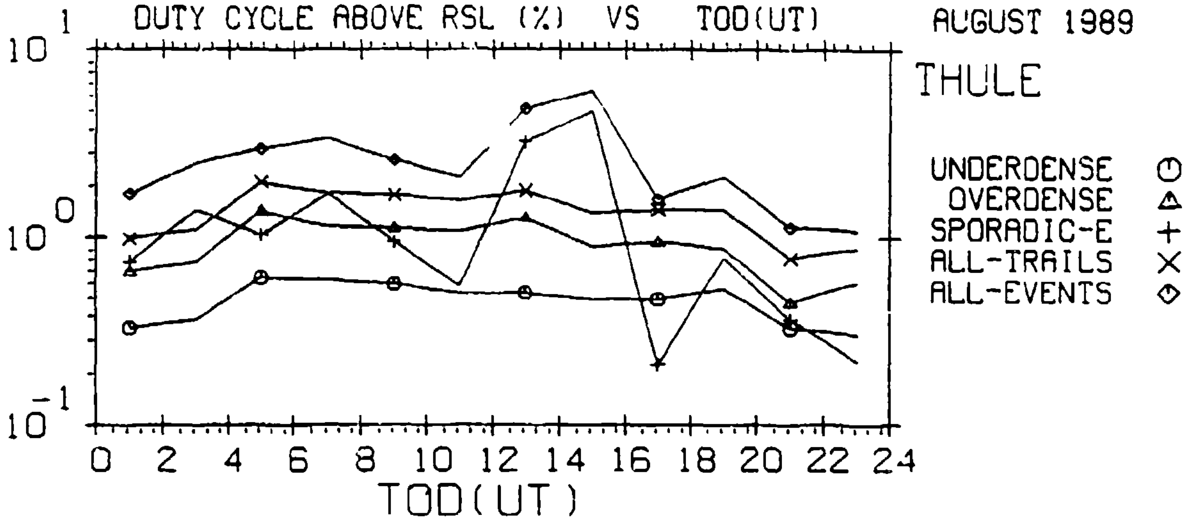
MENU=103,07-2
20-APR-93
PLOT= 37.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

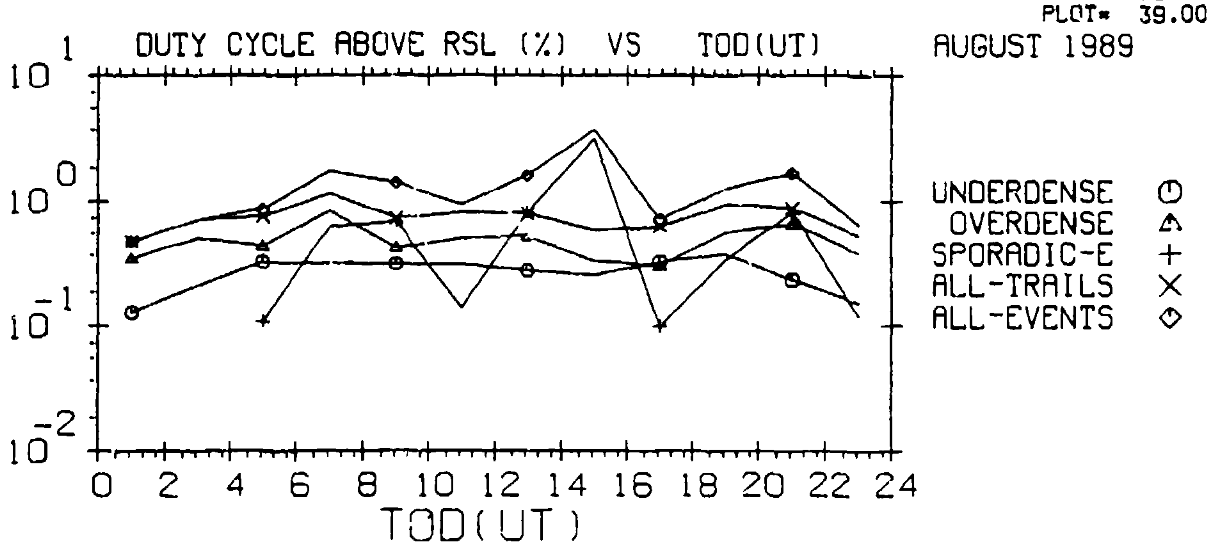
MENU=103,07-2
20-APR-93
PLOT= 38.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

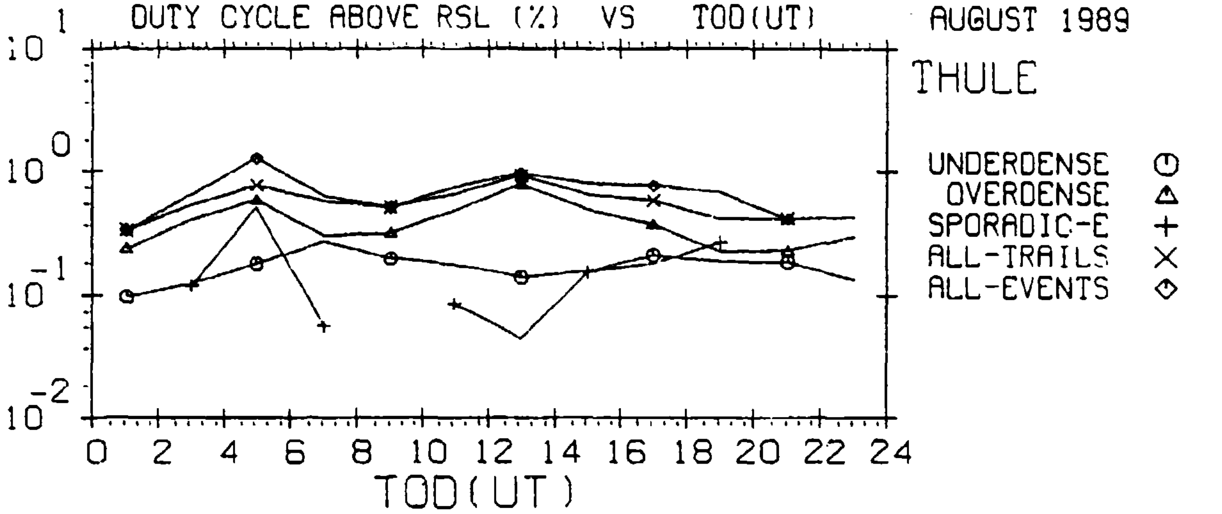
MENU=103,07-2
20-APR-93
PLOT= 39.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

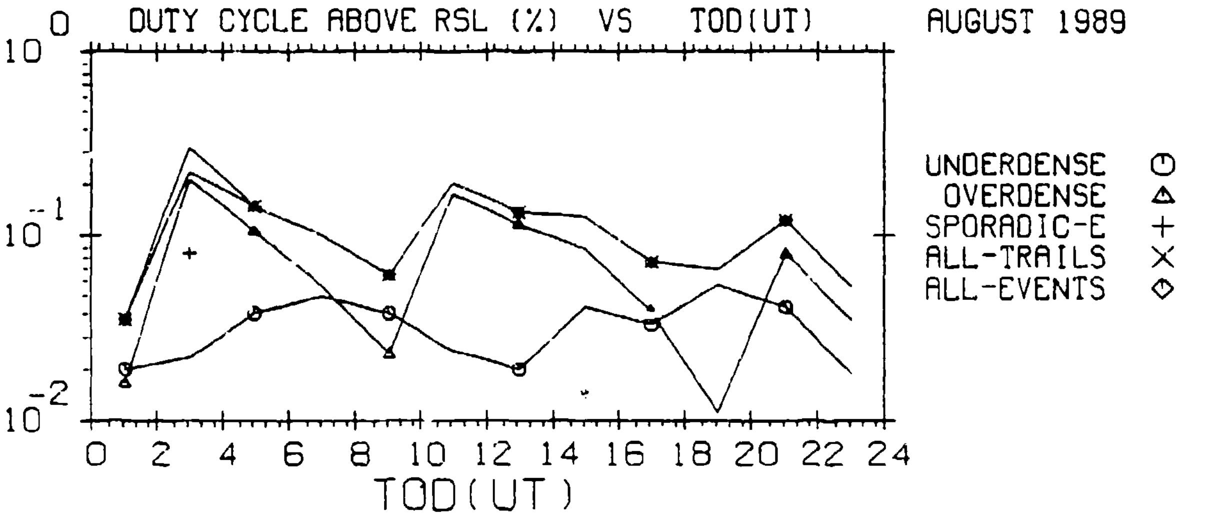
MENU=103,07-2
20-APR-93
PLOT= 40.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

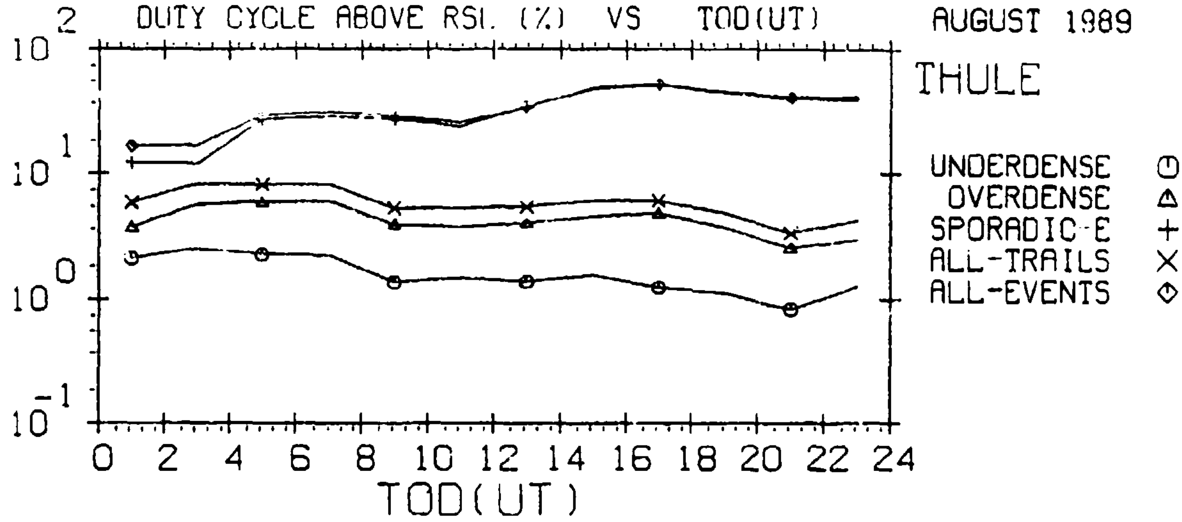
MENU=103,07-2
20-APR-93
PLOT= 41.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

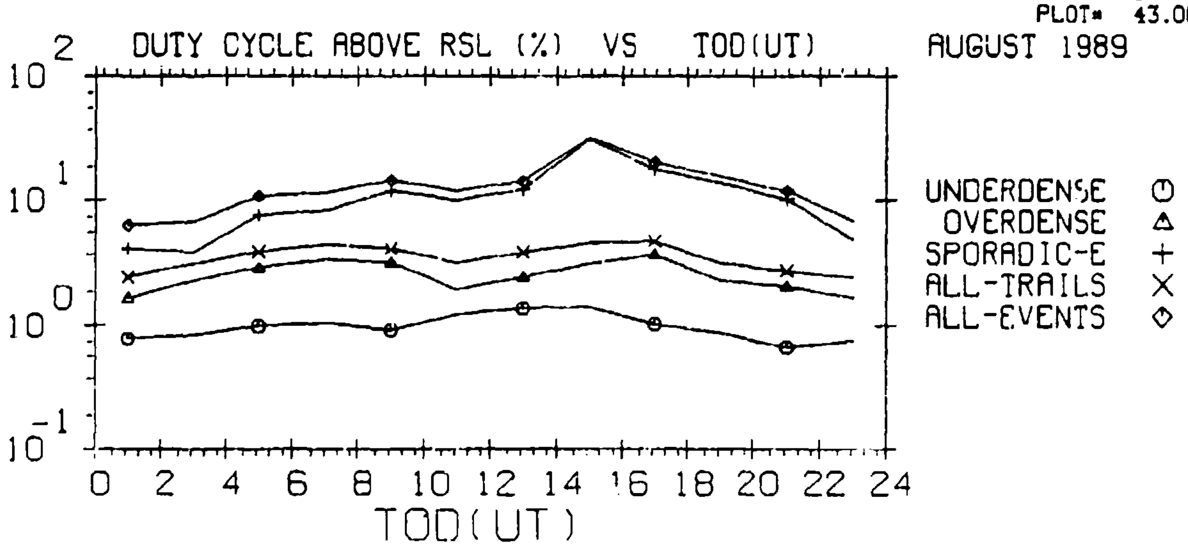
MENU=103,07-2
20-APR-93
PLOT= 42.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

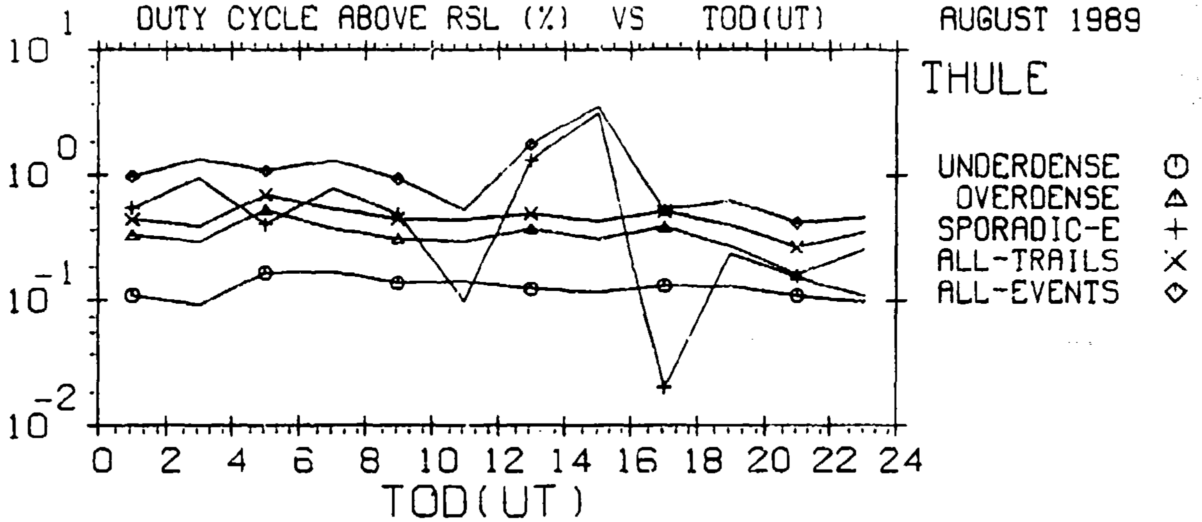
MENU=103,07-2
20-APR-93
PLOT= 43.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

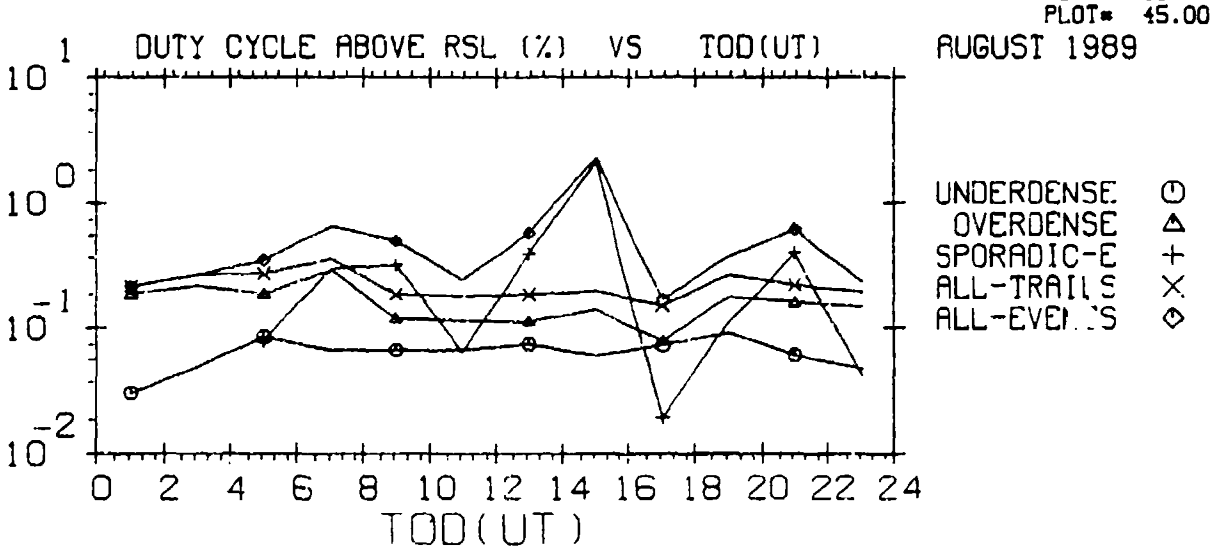
MENU=103,07-2
20-APR-93
PLOT= 44.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

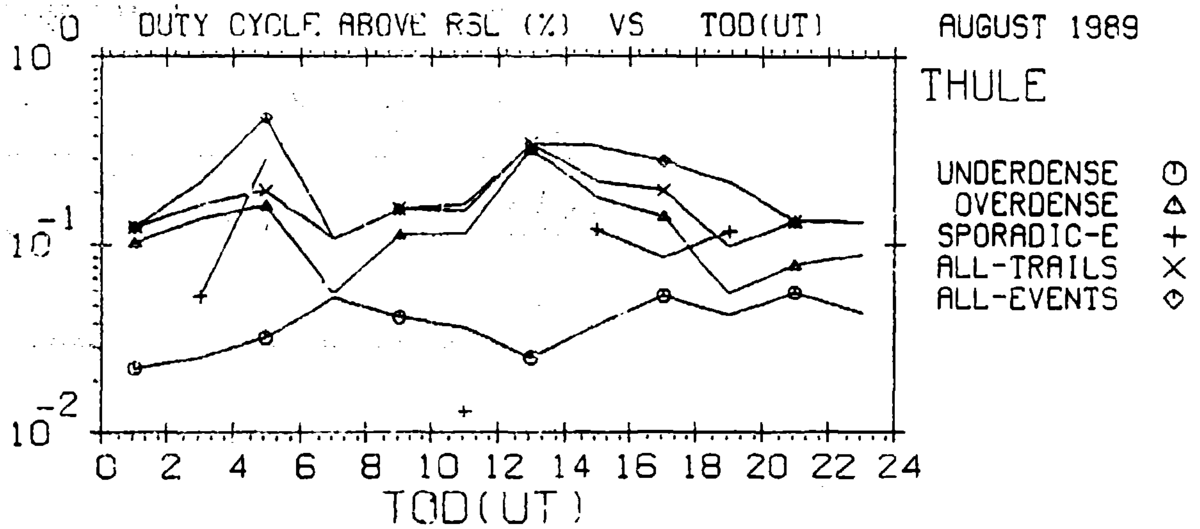
MENU=103,07-2
20-APR-93
PLOT= 45.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

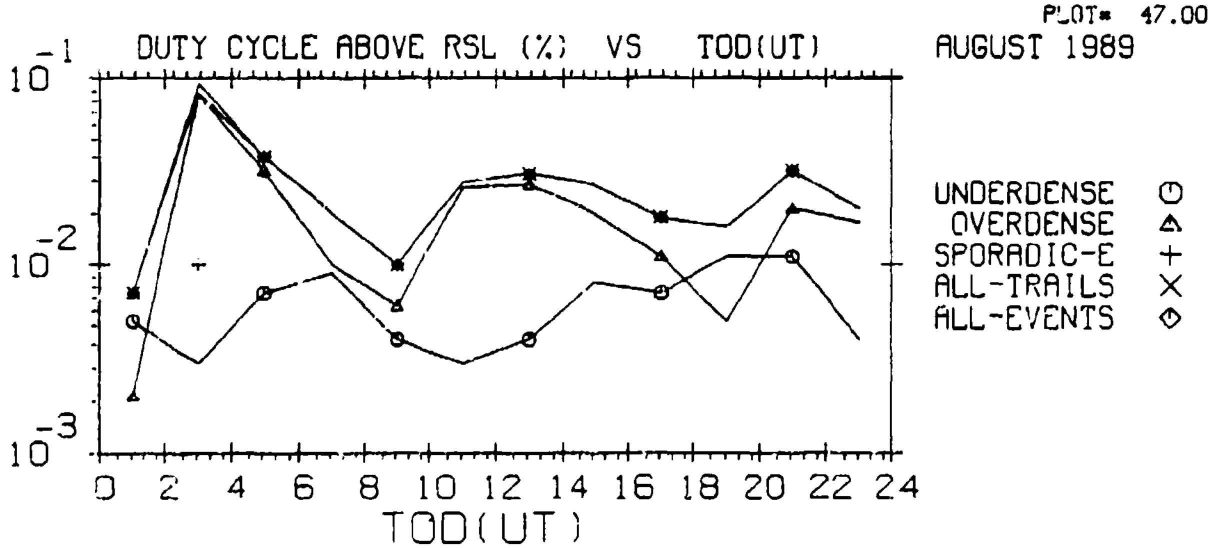
MENU=103,07-2
20-APR-93
PLOT= 46.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

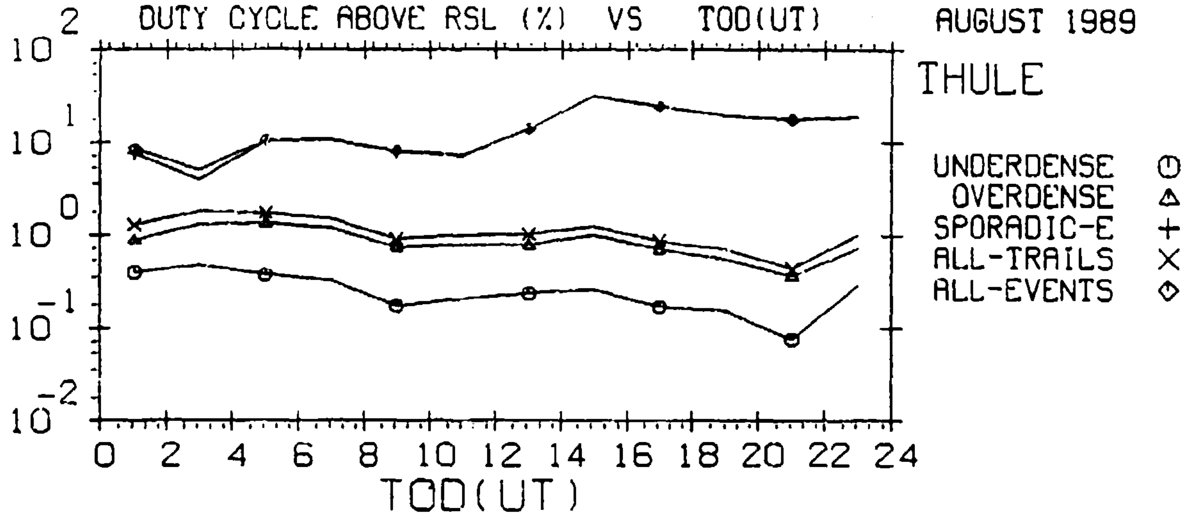
MENU=103,07-2
20-APR-93
PLOT= 47.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

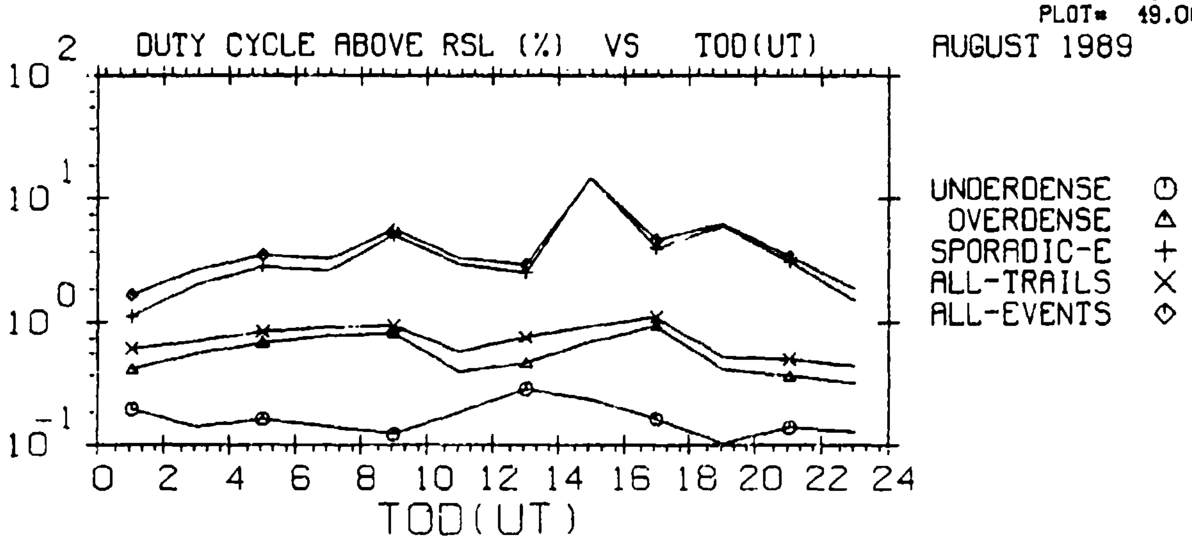
MENU=103,07-2
20-APR-93
PLOT= 48.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

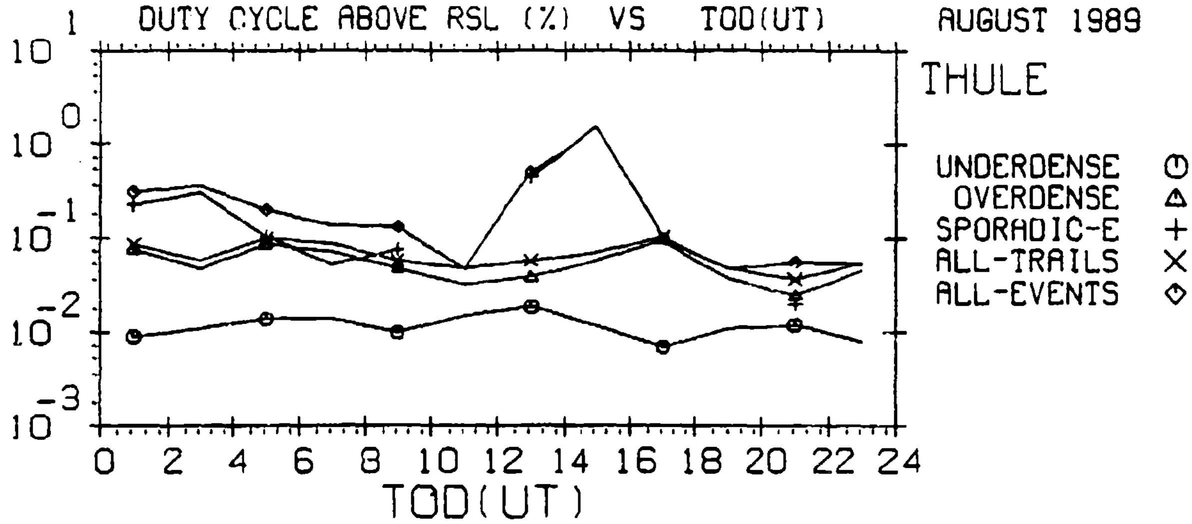
MENU= 103,07-2
20-APR-93
PLOT= 49.00




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

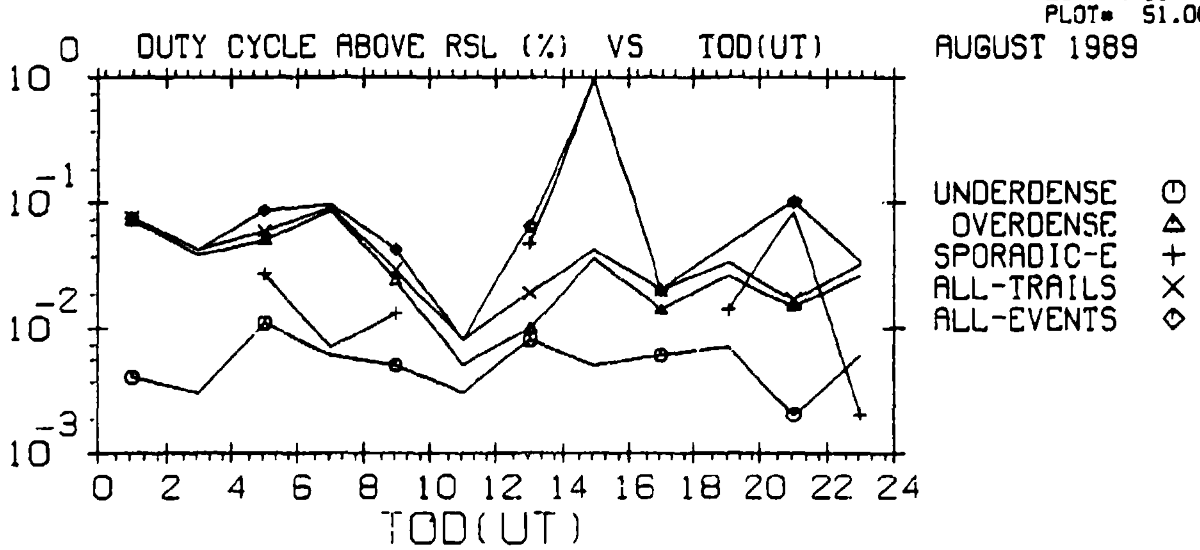
MENU= 103,07-2
20-APR-93
PLOT= 50.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

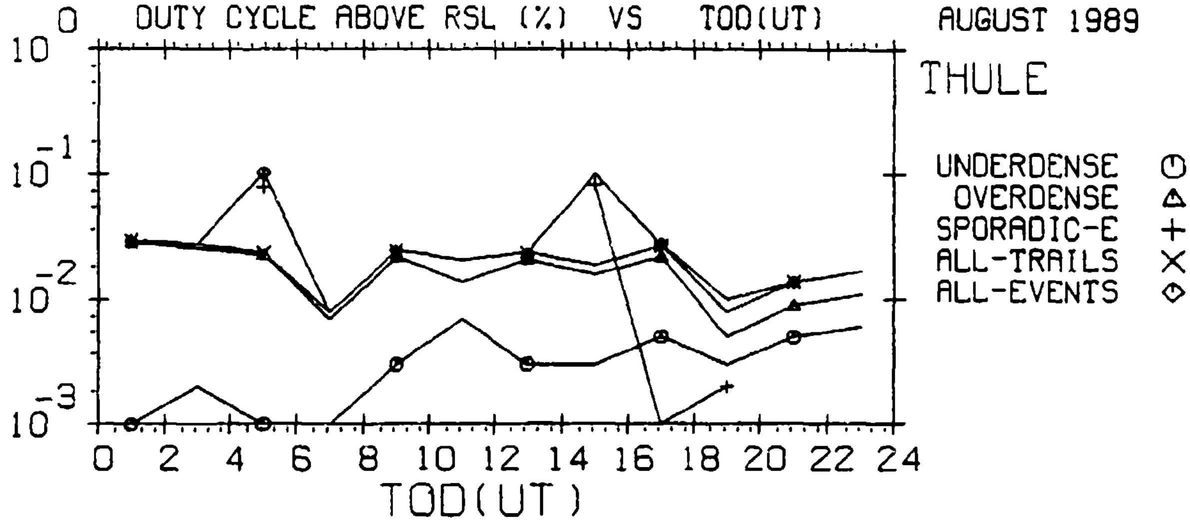
MENU=103,07-2
20-APR-93
PLOT= 51.00




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

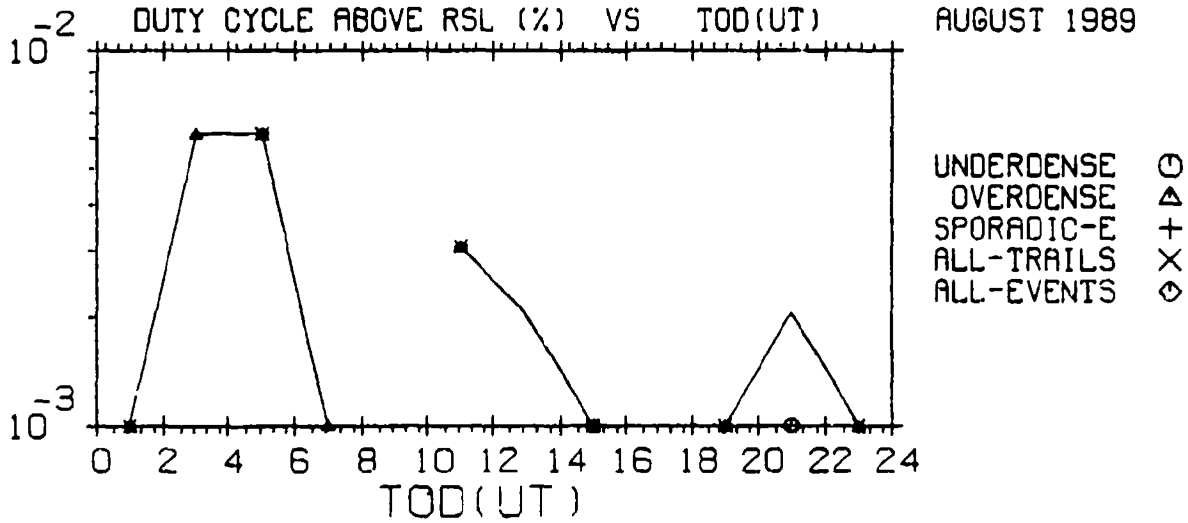
MENU=103,07-2
20-APR-93
PLOT= 52.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

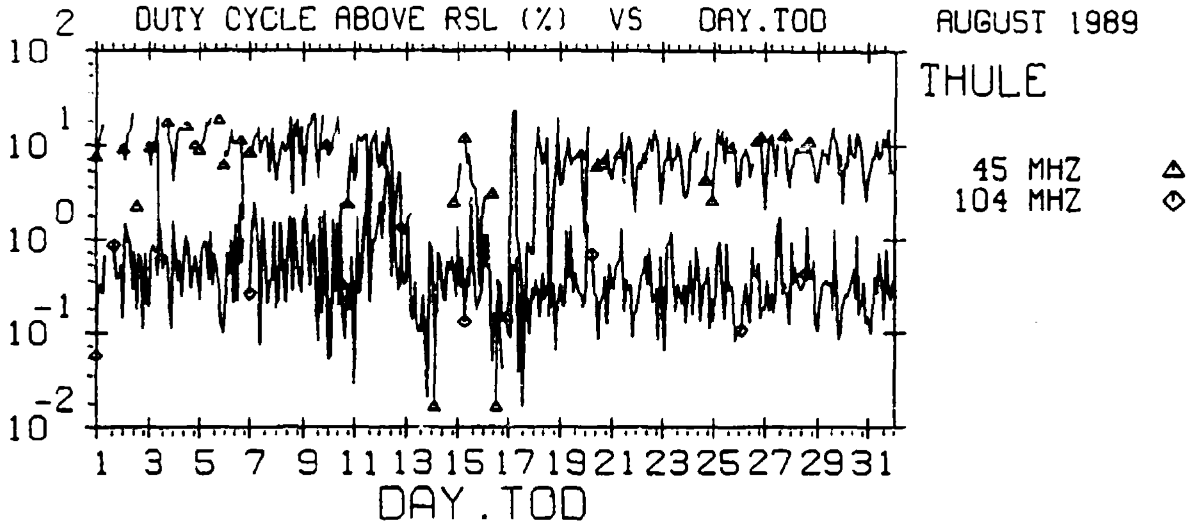
MENU=103,07-2
20-APR-93
PLOT= 53.00




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

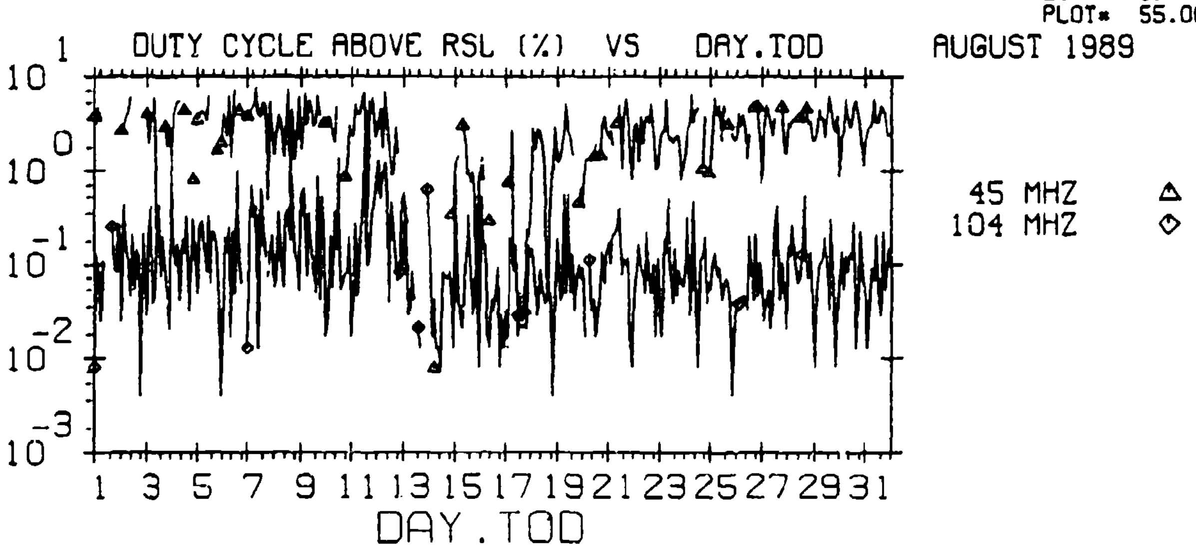
MENU=103,07-2
20-APR-93
PLOT= 54.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

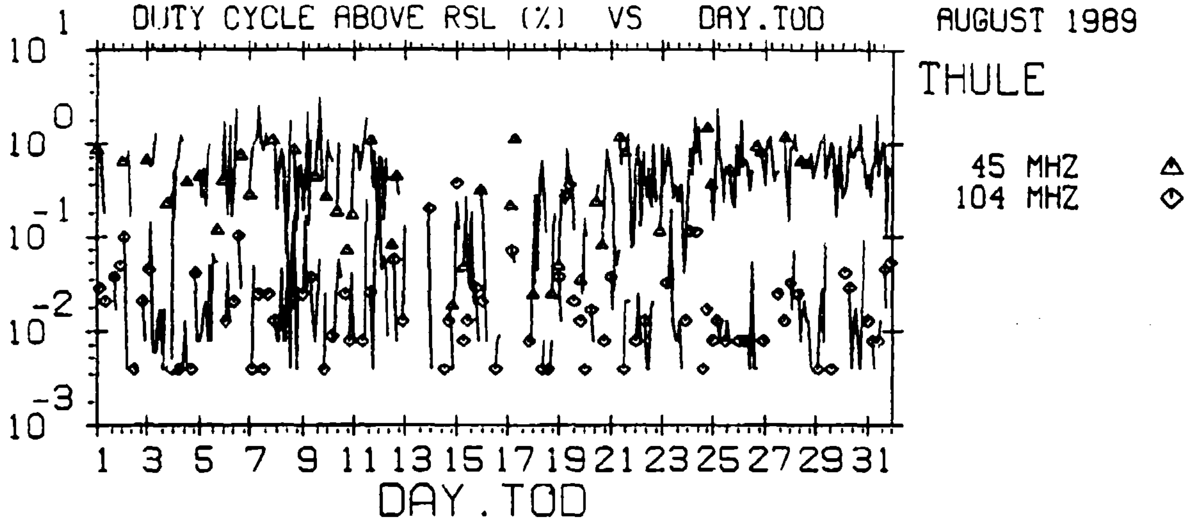
MENU=103,09-2
20-APR-93
PLOT= 55.00




THRESHOLD - -116.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

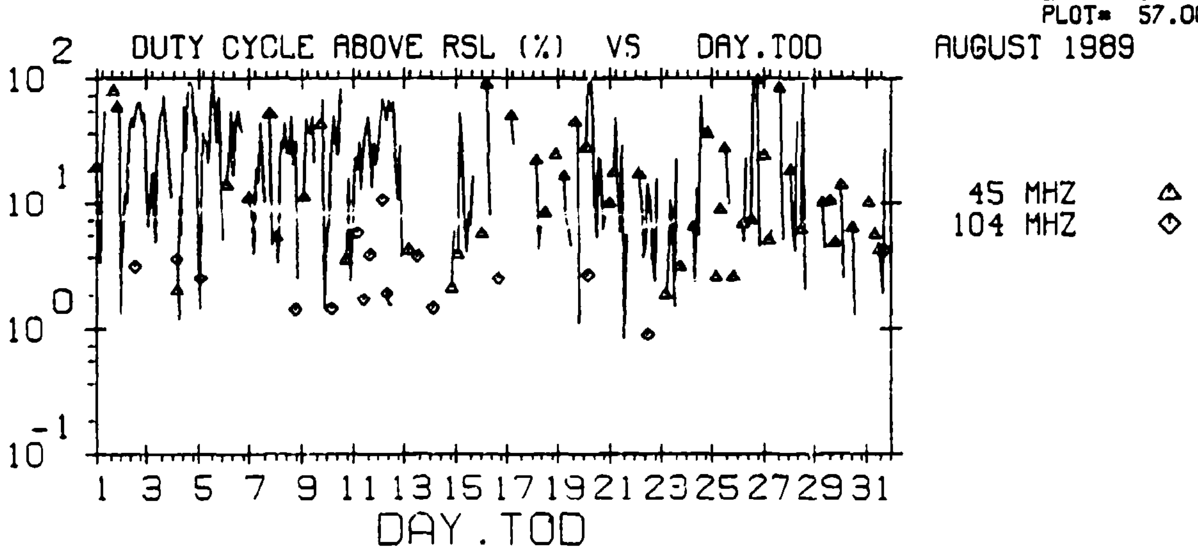
MENU=103,09-2
20-APR-93
PLOT= 56.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

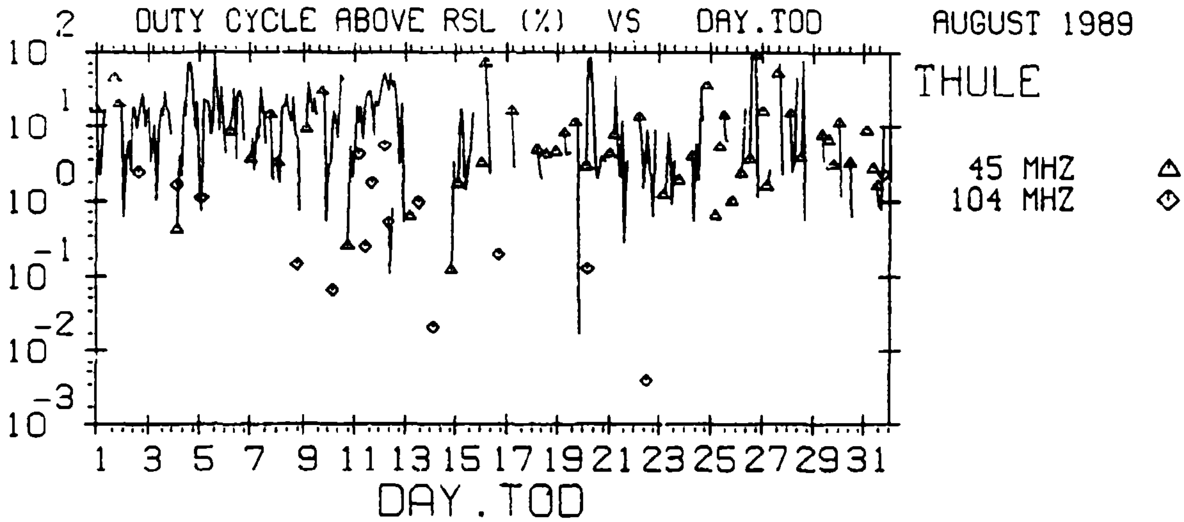
MENU=103,09-2
20-APR-93
PLOT= 57.00




THRESHOLD - -126.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

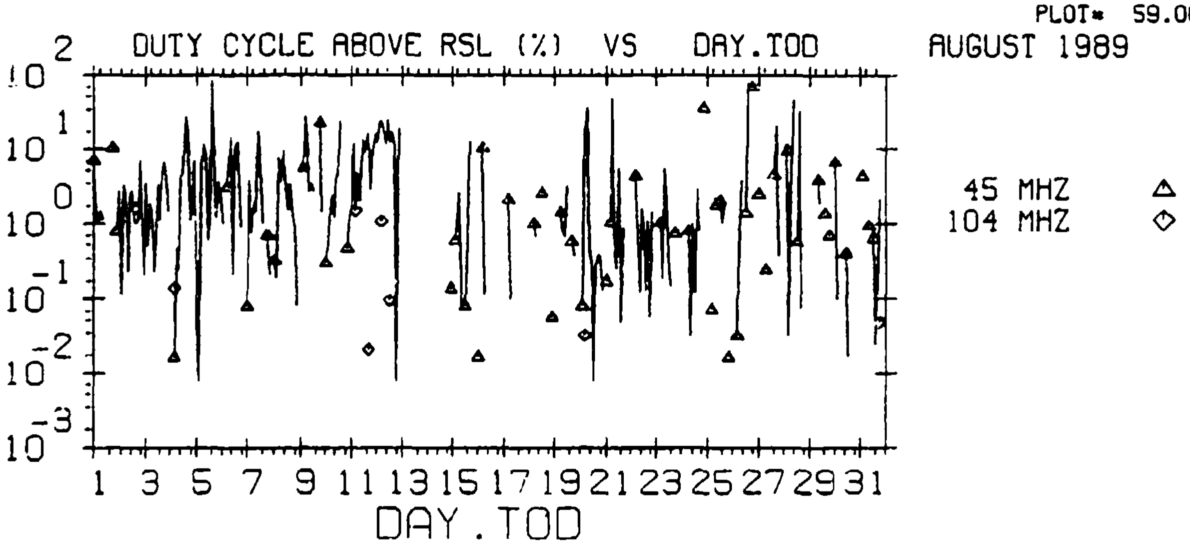
MENU=103,09-2
20-APR-93
PLOT= 58.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD = -116.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

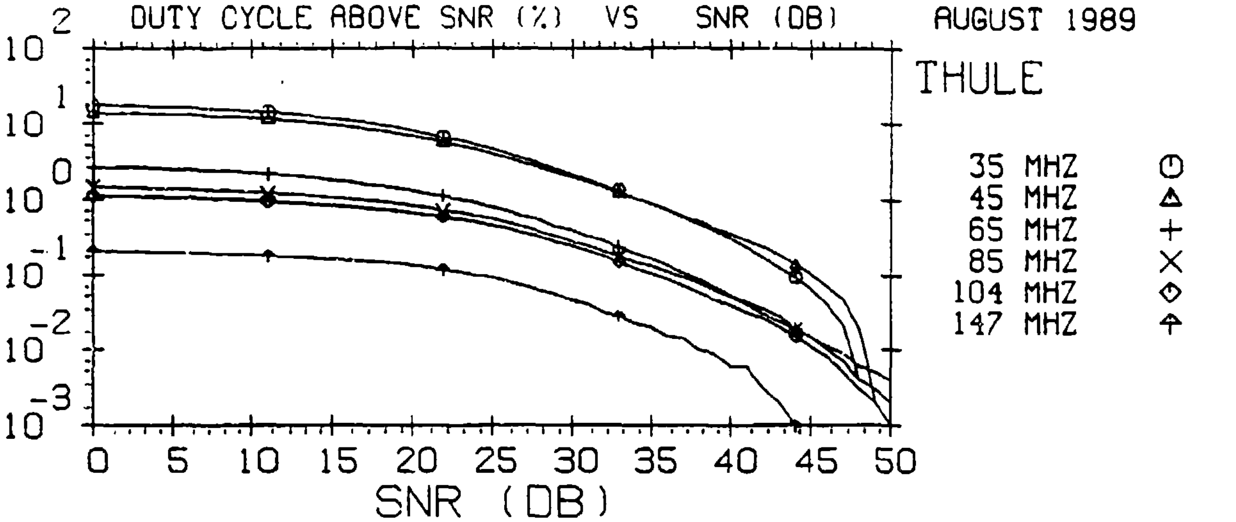
MENU=103,09-2
20-APR-93
PLOT= 59.00




THRESHOLD - -106.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

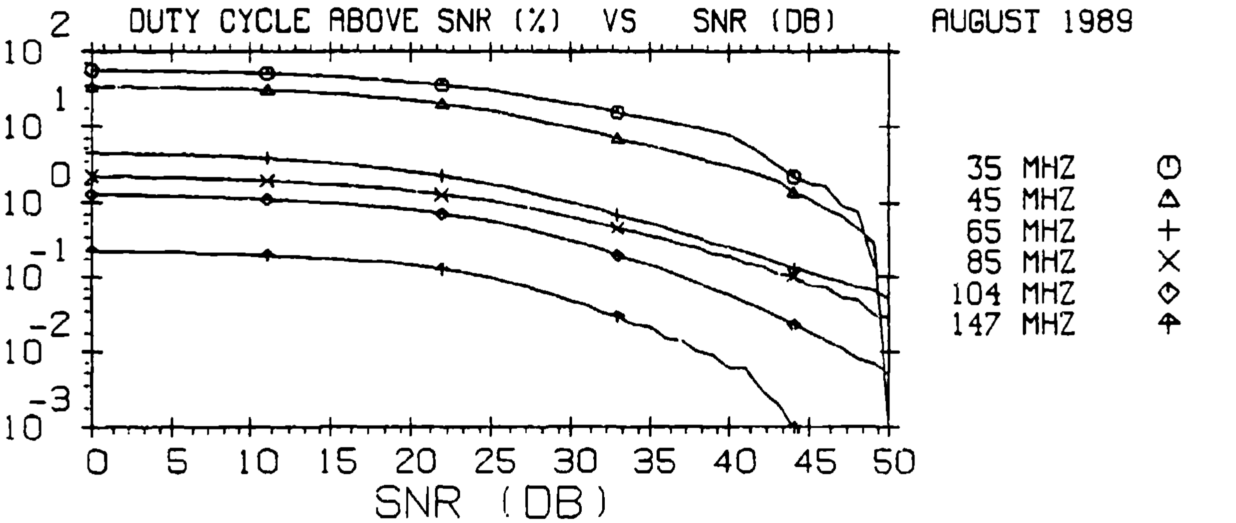
MENU=103,09-2
20-APR-93
PLOT= 60.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

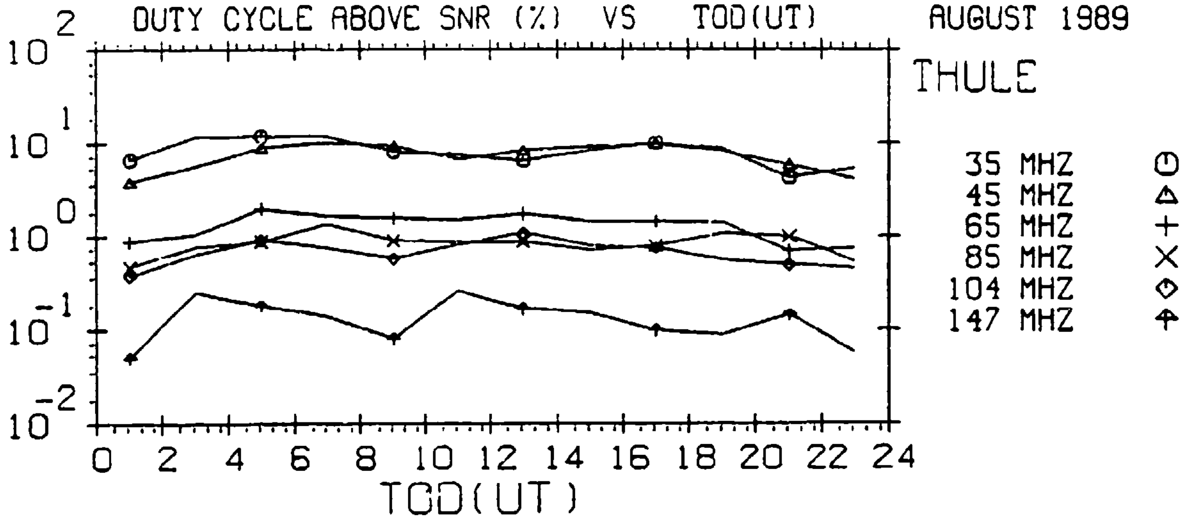
MENU= 104,02-2
20-APR-93
PLOT= 61.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

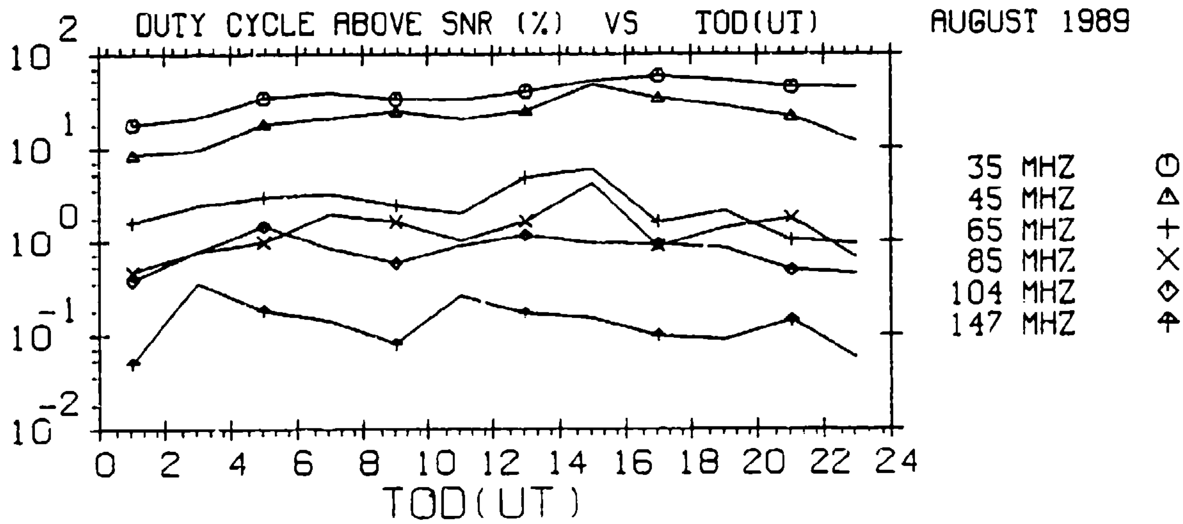
MENU= 104,02-2
20-APR-93
PLOT= 62.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




SIGNAL-TO-NOISE RATIO = 19.0 DB
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

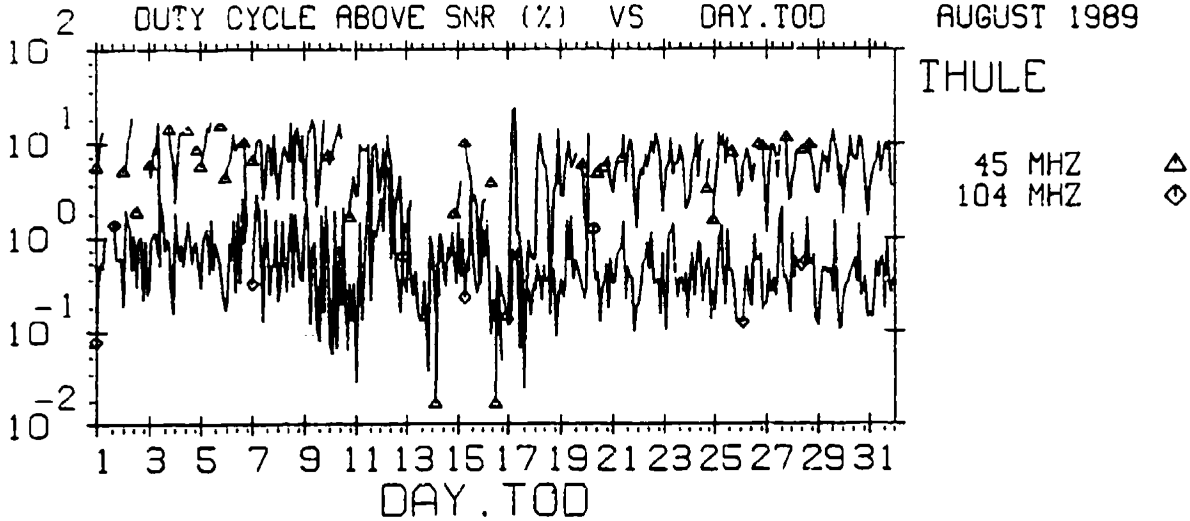
MENU=104,03-2
20-APR-93
PLOT= 63.00




SIGNAL-TO-NOISE RATIO = 19.0 DB
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

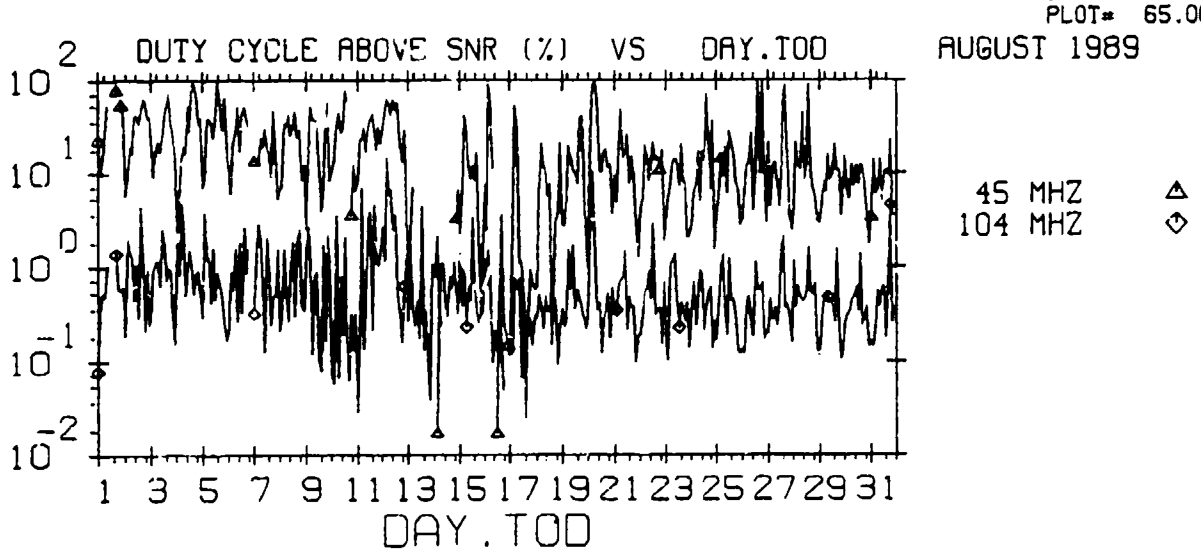
MENU=104,03-2
20-APR-93
PLOT= 64.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




SIGNAL-TO-NOISE RATIO - 19.0 DB
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

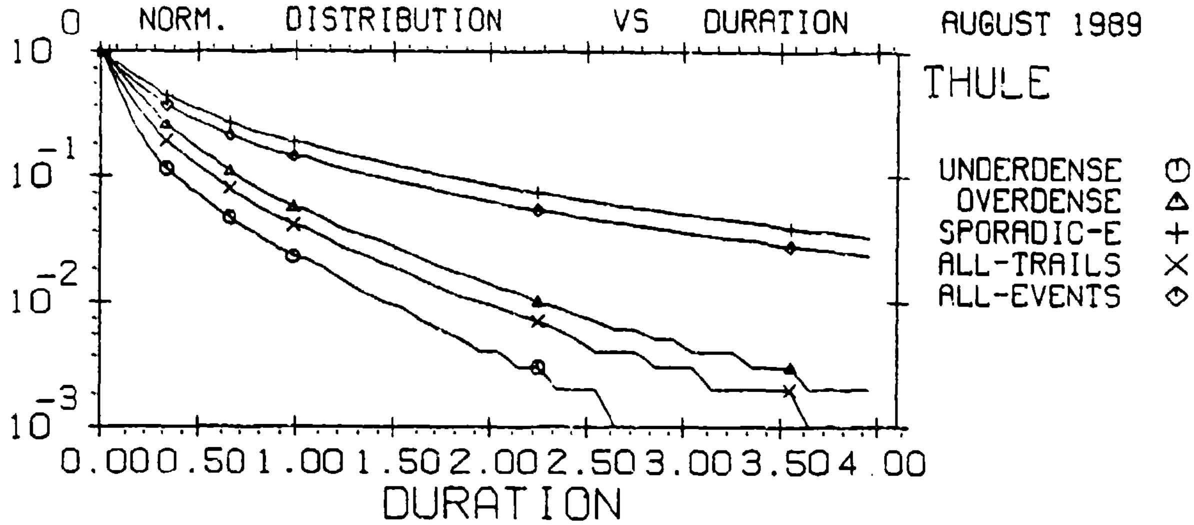
MENU* 104,09-2
20-APR-93
PLOT* 65.00




SIGNAL-TO-NOISE RATIO - 19.0 DB
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

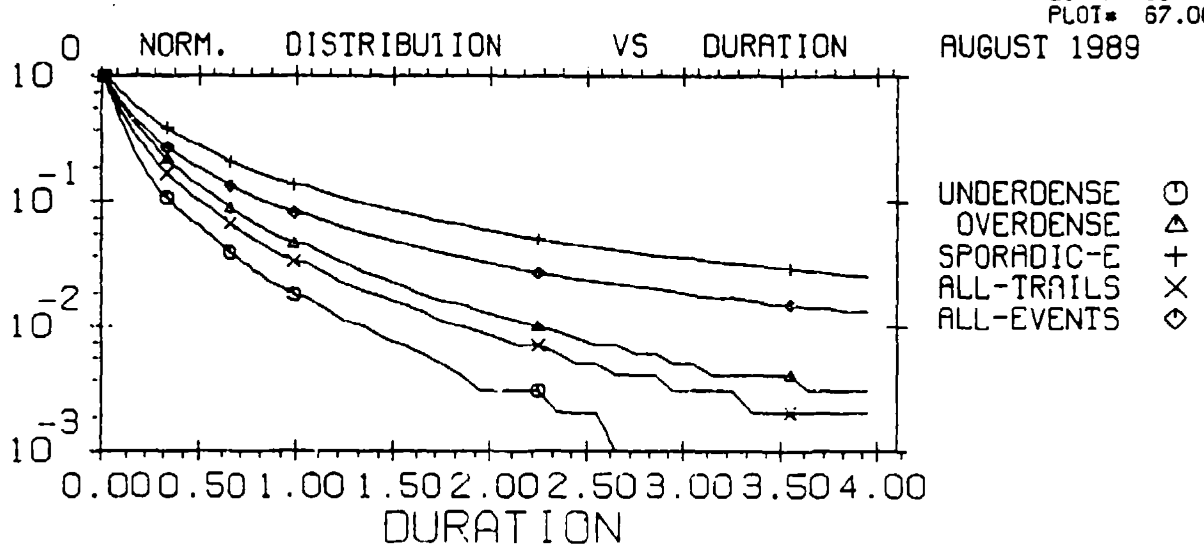
MENU* 104,09-2
20-APR-93
PLOT* 66.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 18251. OVER - 20181. SPOR-E - 91859.
TRAILS - 38432. EVENTS - 130291.

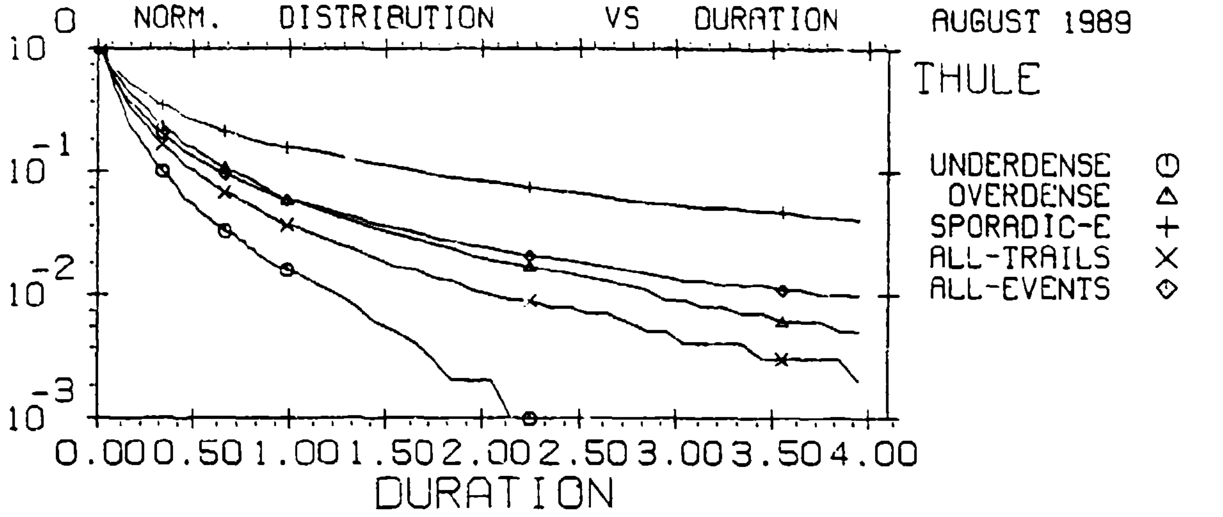
MENU=106,02-4
20-APR-93
PLOT= 67.00




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 20098. OVER - 24596. SPOR-E - 40516.
TRAILS - 44694. EVENTS - 85210.

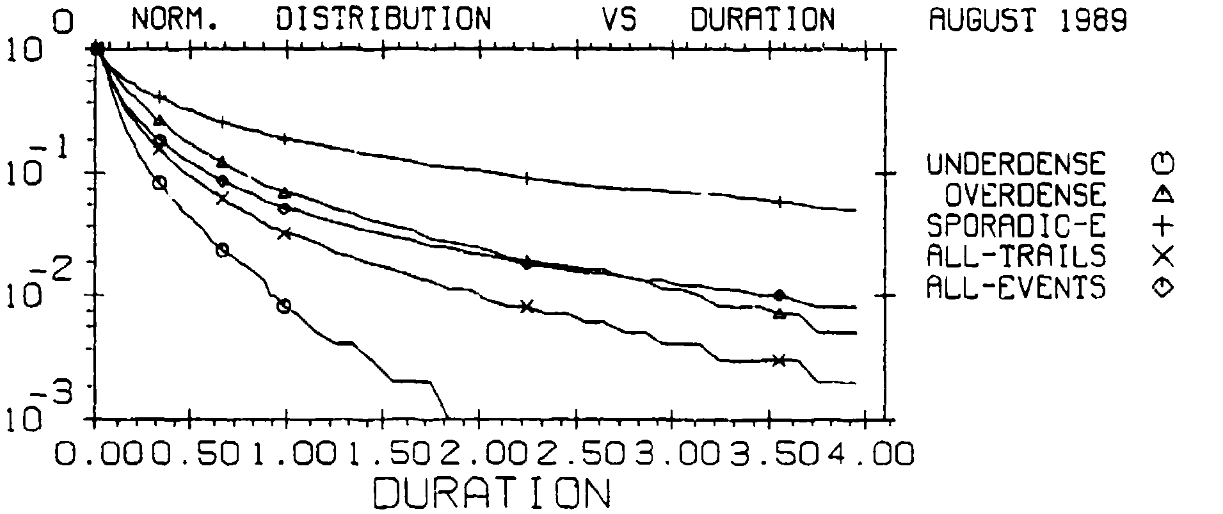
MENU=106,02-4
20-APR-93
PLOT= 68.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 7354. OVER - 6793. SPOR-E - 3295.
TRAILS - 14147. EVENTS - 17442.

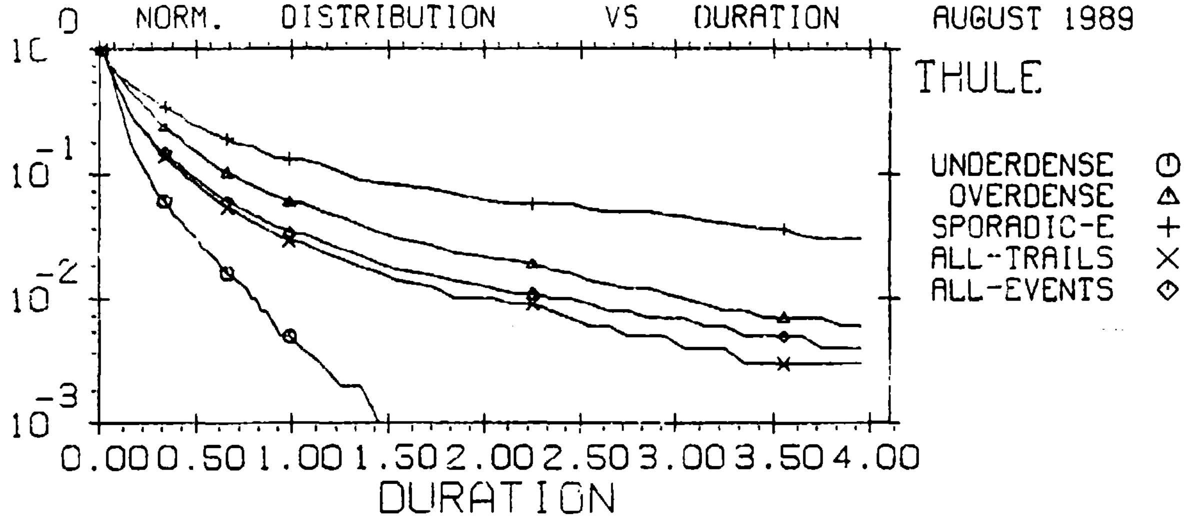
MENU=106,02-4
20-APR-93
PLOT= 69.00




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 4988. OVER - 3224. SPOR-E - 1169.
TRAILS - 8212. EVENTS - 9381.

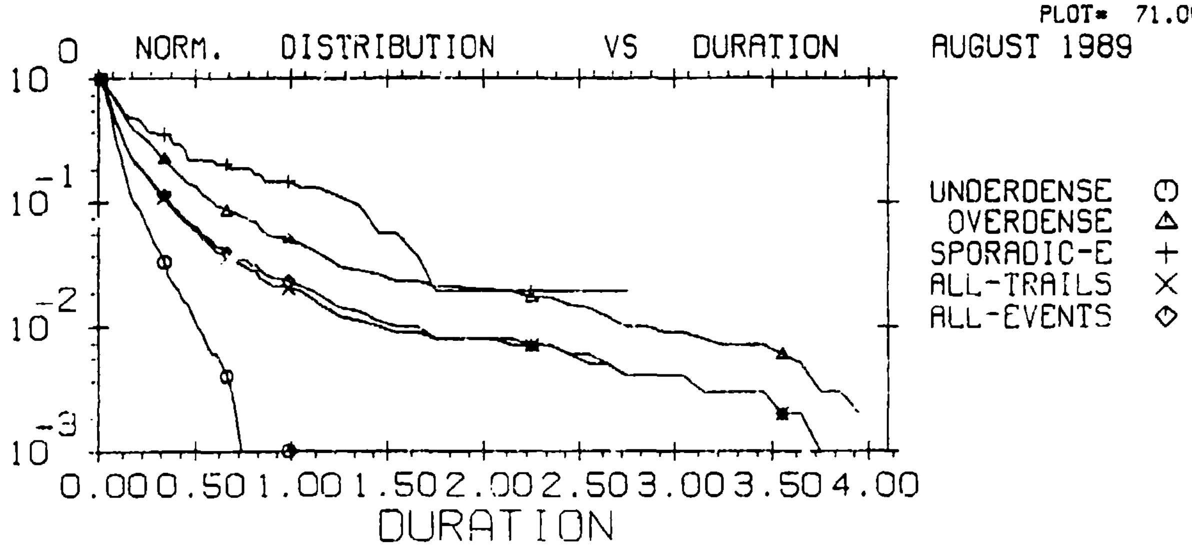
MENU=106,02-4
20-APR-[illegible]
PLOT= [illegible].00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY 104 MHZ
BASED ON ..SERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5159. OVER - 4008. SPOR-E - 500.
TRAILS - 9167. EVENTS - 9667.

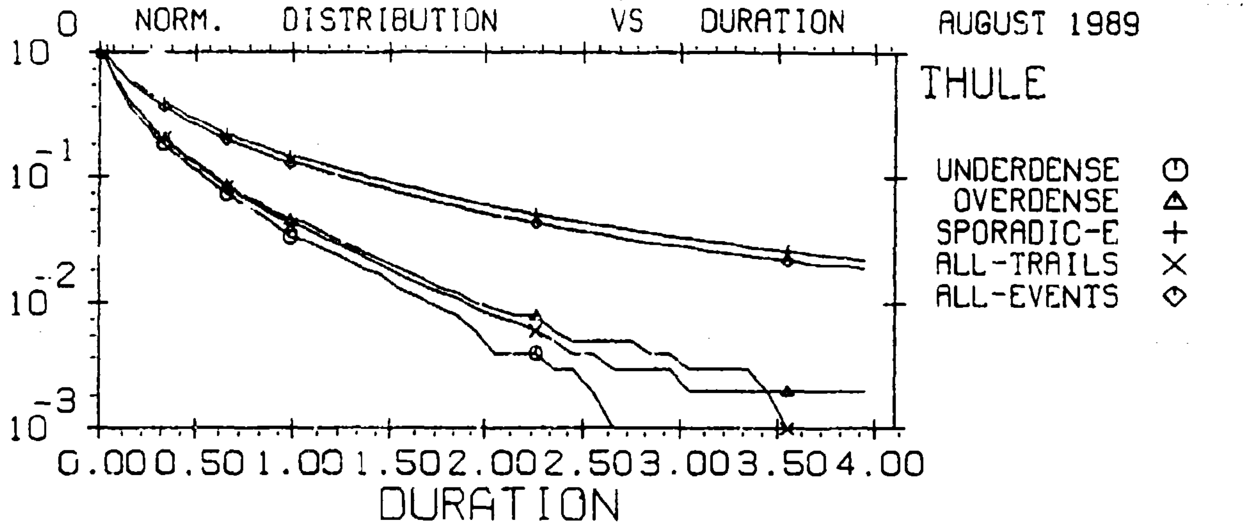
MENU* 106,02-4
20-APR-93
PLOT* 71.00




EXCEEDING -126.0 DBM RSL
.. TIME OF DAY IS 0 - 24 HOURS U.T.
.. QUENCY - 147 MHZ
.. ED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
..ORMALIZING FACTORS:
UNDER - 1346. OVER - 861. SPOR-E - 54.
TRAILS - 2207. EVENTS - 2261.

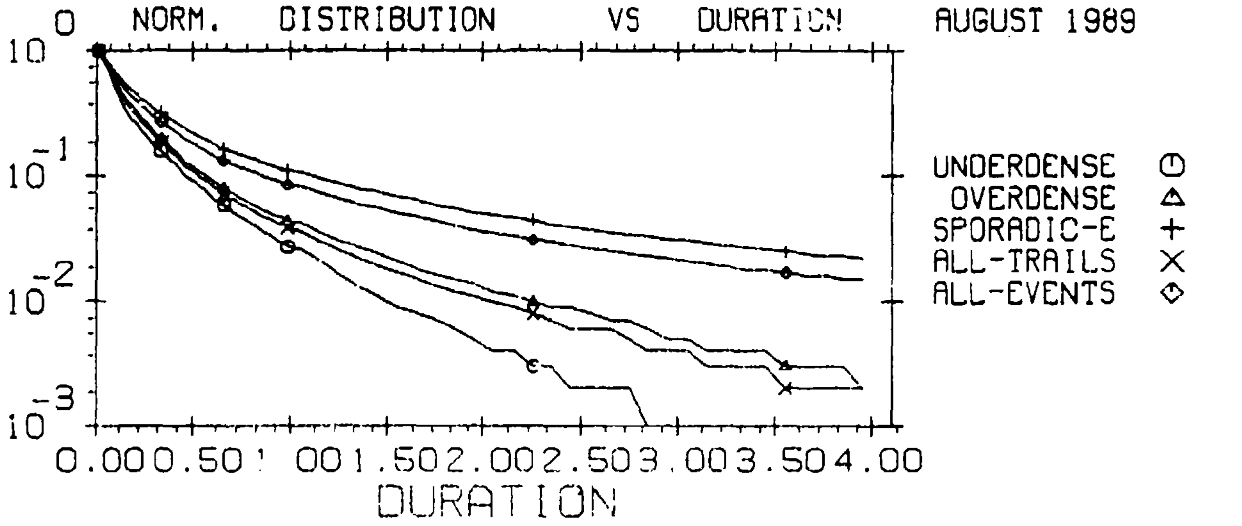
MENU* 106,02-4
20-APR-93
PLOT* 72.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5395. OVER - 10780. SPOR-E - 82178.
TRAILS - 16175 EVENTS - 98353.

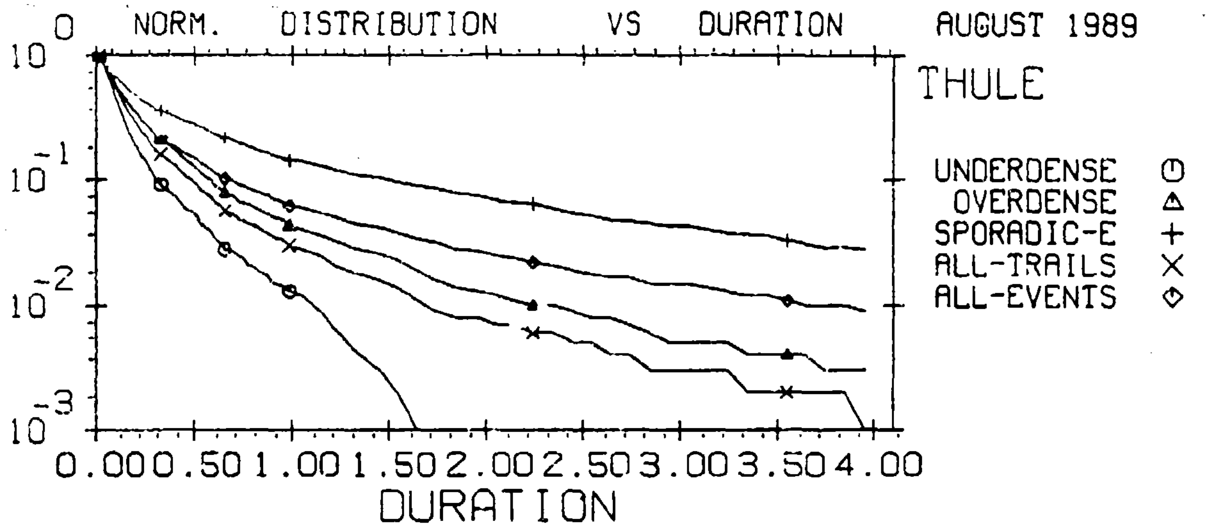
MENU*106,02-4
20-APR-93
PLOT* 73.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5155. OVER - 9878. SPOR-E - 28234.
TRAILS - 15033. EVENTS - 43267.

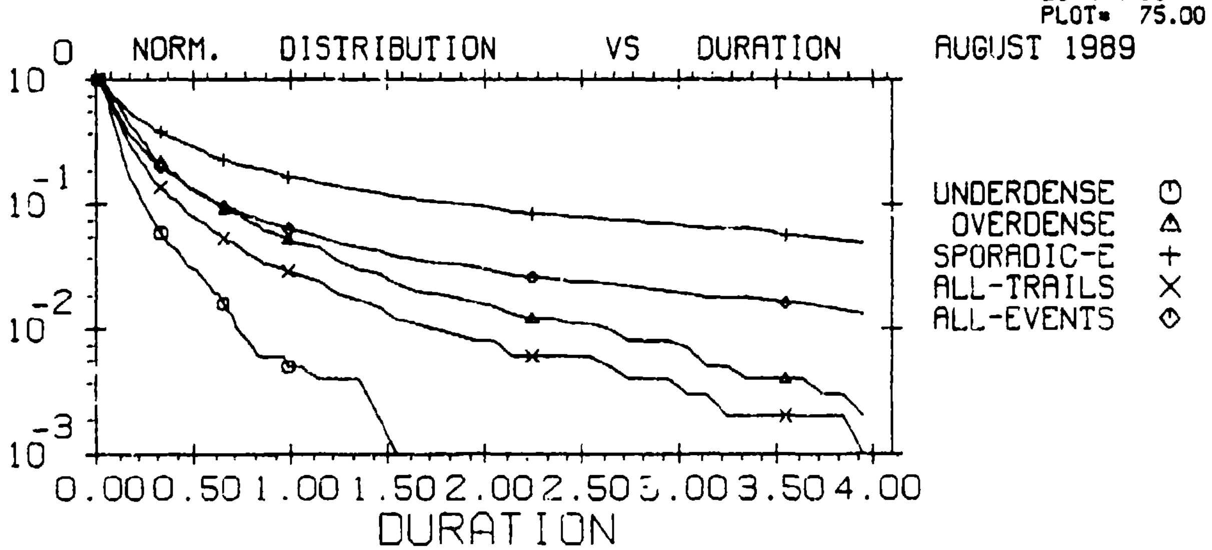
MENU*106,02-4
20-APR-93
PLOT* 74.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 2105. OVER - 2786. SPOR-E - 1991.
TRAILS - 4891. EVENTS - 6882.

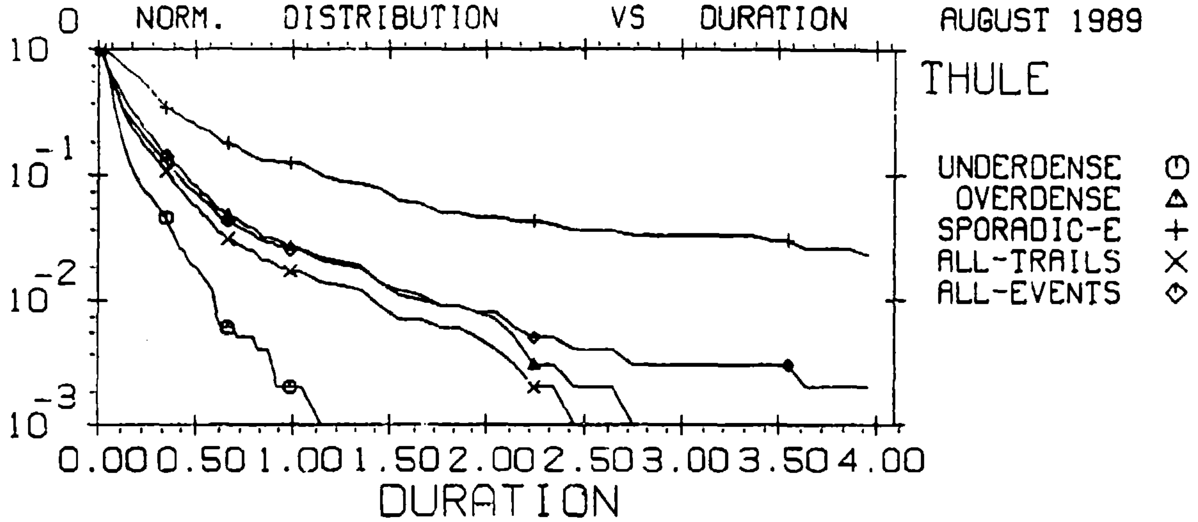
MENU=106,02-4
20-APR-93
PLOT= 75.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1343. OVER - 1320. SPOR-E - 903.
TRAILS - 2663. EVENTS - 3566.

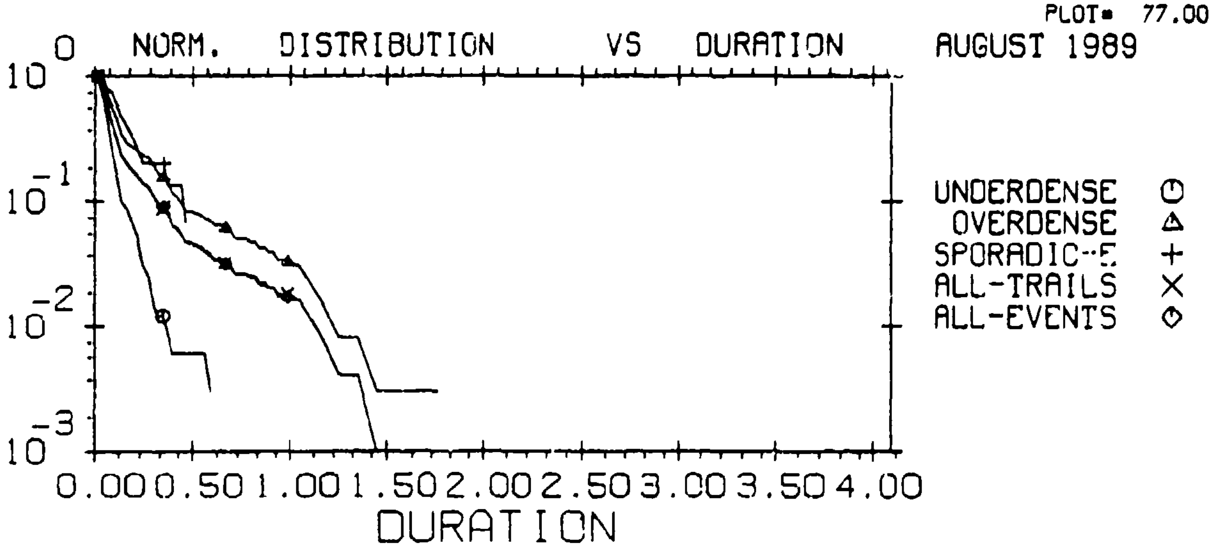
MENU=106,02-4
20-APR-93
PLOT= 76.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1405. OVER - 2103. SPOR-E - 302.
TRAILS - 3508. EVENTS - 3810.

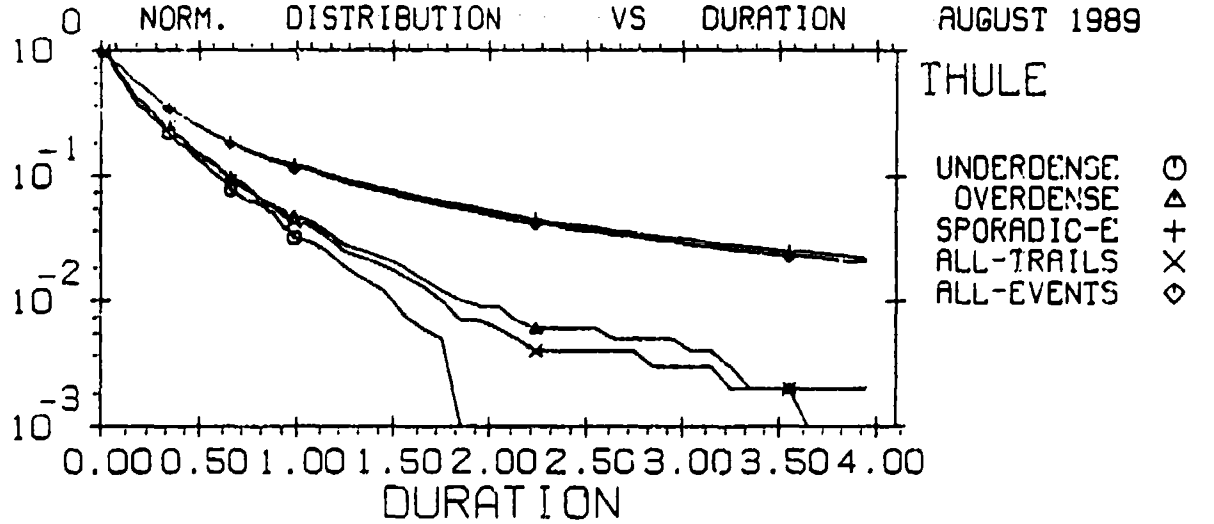
MENU=106,02-4
20-APR-93
PLOT= 77.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 322. OVER - 361. SPOR-E - 15.
TRAILS - 683. EVENTS - 698.

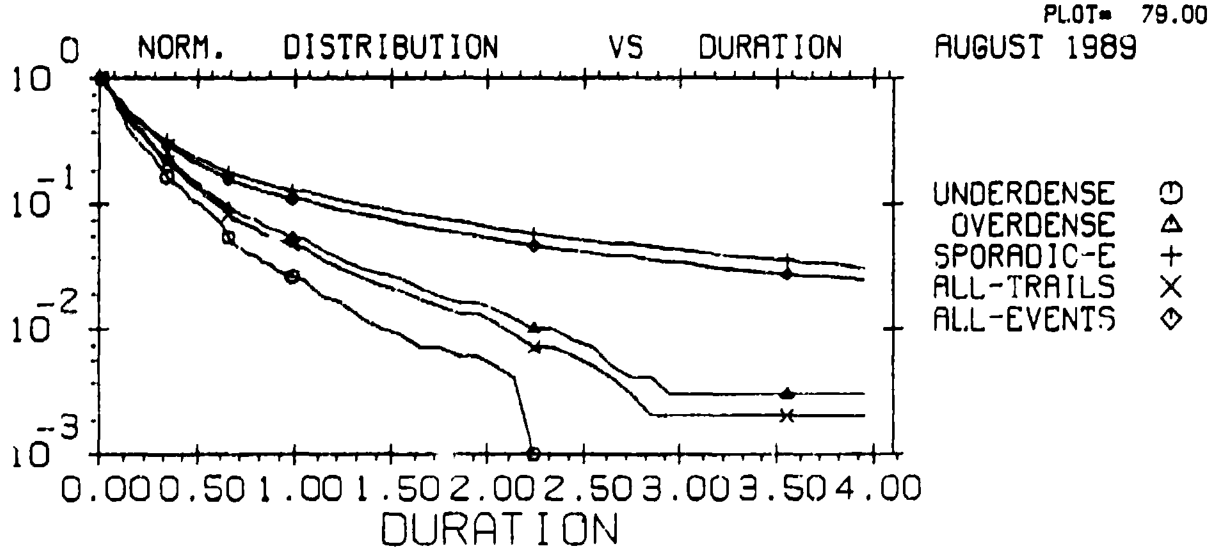
MENU=106,02-4
20-APR-93
PLOT= 78.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 862. OVER - 2098. SPOR-E - 35617.
TRAILS - 2960. EVENTS - 38577.

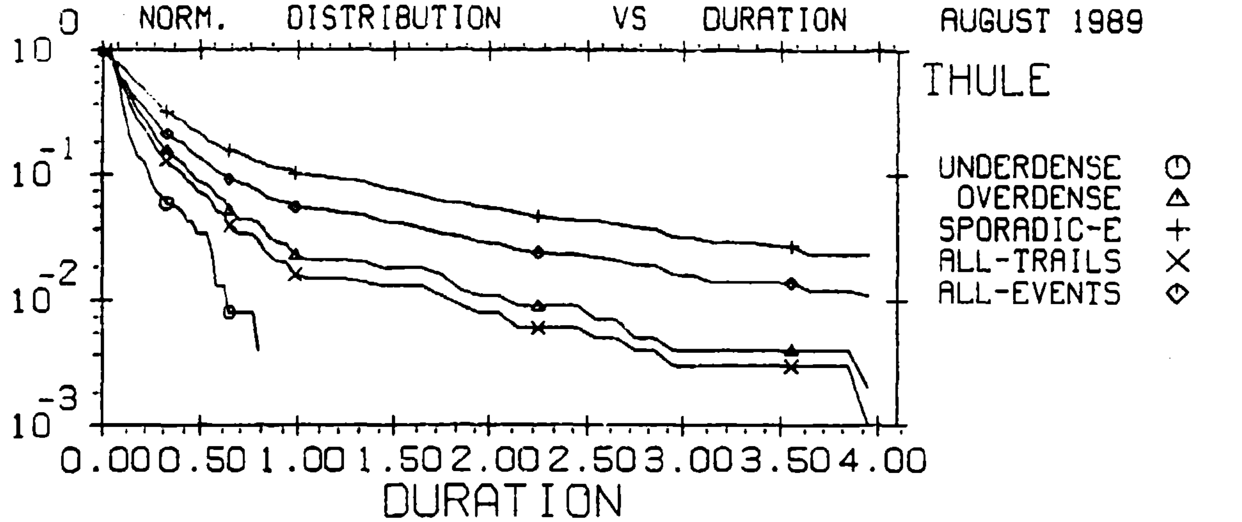
MENU= 106,02-4
20-APR-93
PLOT= 79.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 818. OVER - 1991. SPOR-E - 9673.
TRAILS - 2809. EVENTS - 12482.

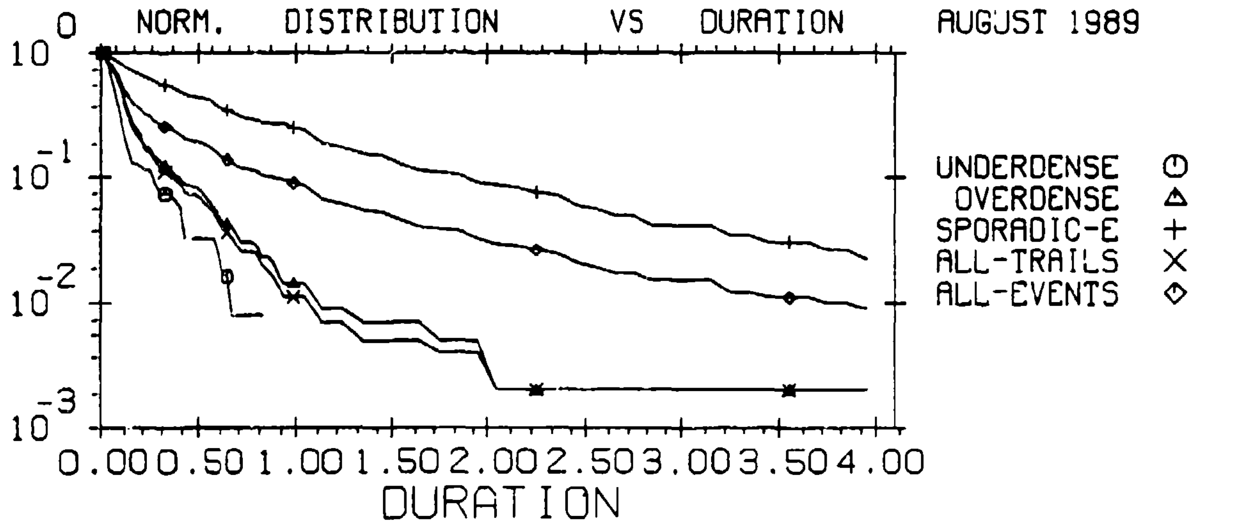
MENU= 106,02-4
20-APR-93
PLOT= 80.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 236. OVER - 562. SPOR-E - 657.
TRAILS - 798. EVENTS - 1455.

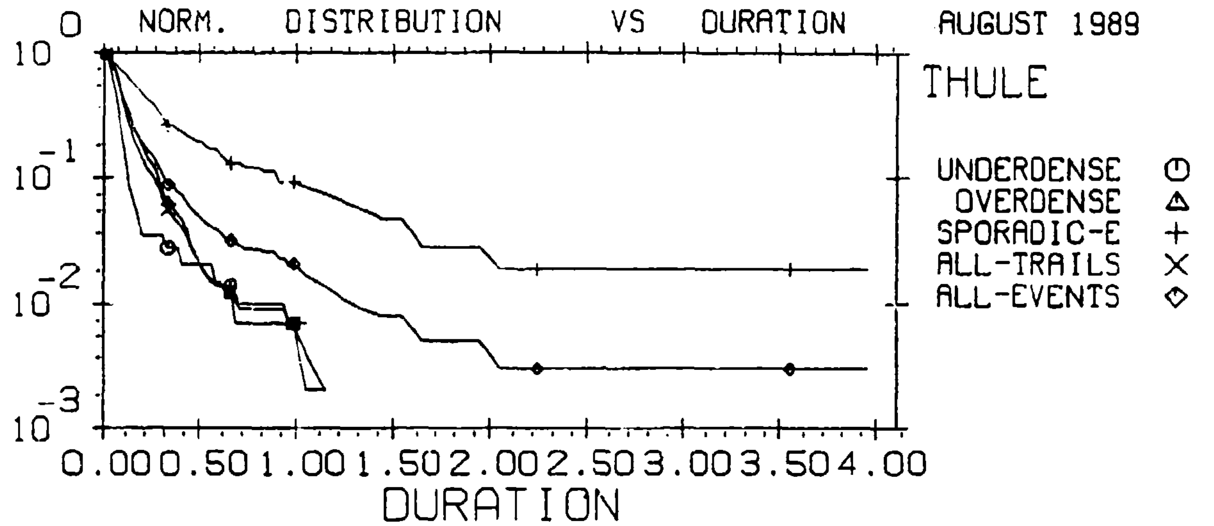
MENU=106,02-4
20-APR-93
PLOT= 81.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 124. OVER - 429. SPOR-E - 268.
TRAILS - 553. EVENTS - 821.

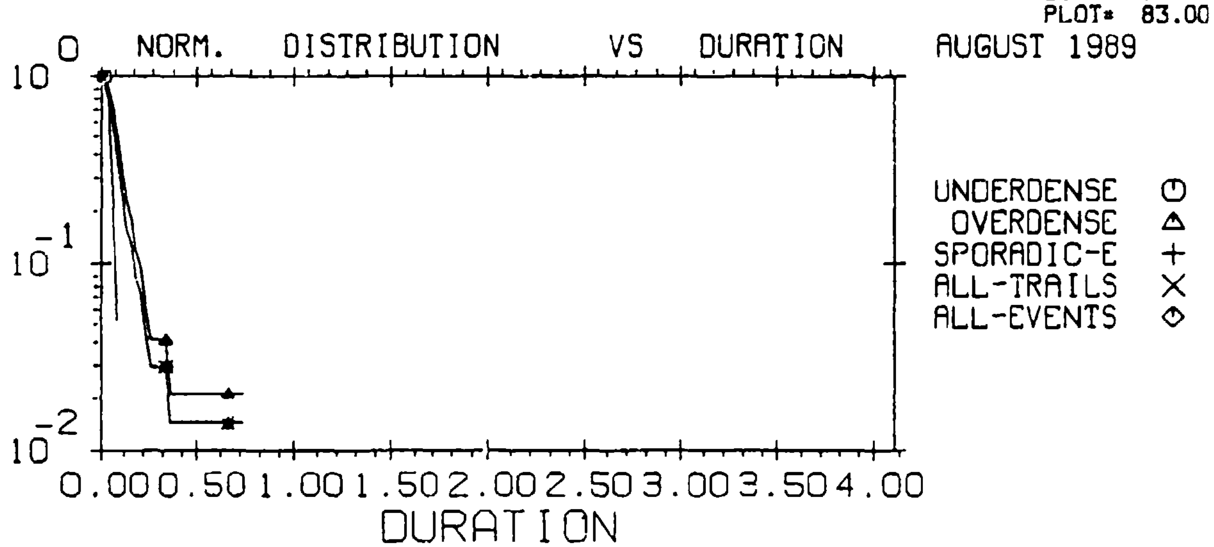
MENU=106,02-4
20-APR-93
PLOT= 82.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 142. OVER - 413. SPOR-E - 107.
TRAILS - 555. EVENTS - 662.

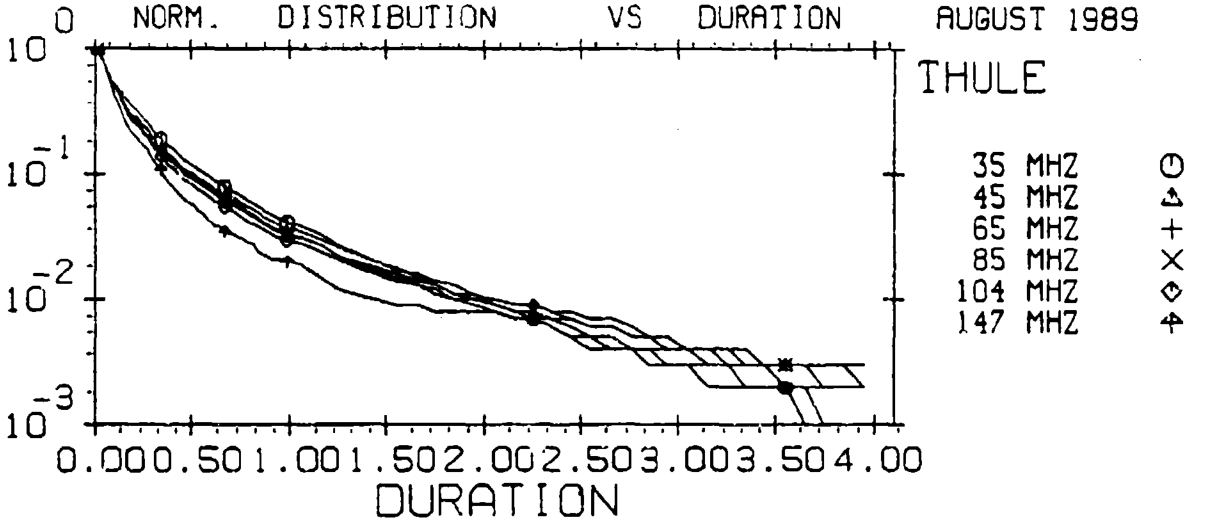
MENU*106,02-4
20-APR-93
PLOT* 83.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 20. OVER - 51. SPOR-E - 0.
TRAILS - 71. EVENTS - 71.

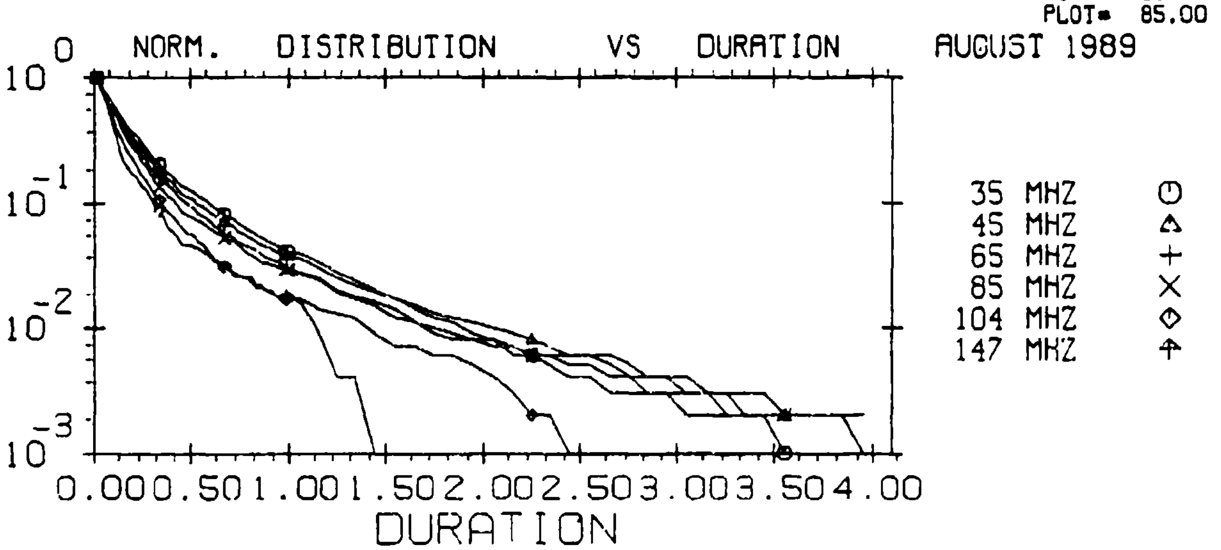
MENU*106,02-4
20-APR-93
PLOT* 84.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 38432. 45MHZ - 44694. 65MHZ - 14147.
85MHZ - 8212. 104MHZ - 9167. 147MHZ - 2207.

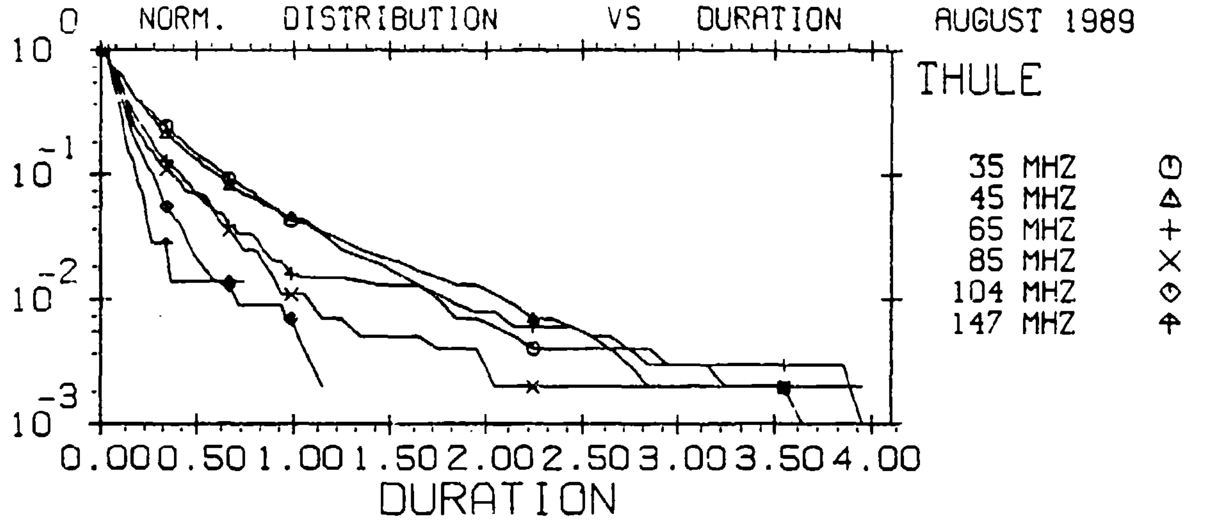
MENU=106,01-4
20-APR-93
PLOT= 85.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 16175. 45MHZ - 15033. 65MHZ - 4891.
85MHZ - 2663. 104MHZ - 3508. 147MHZ - 683.

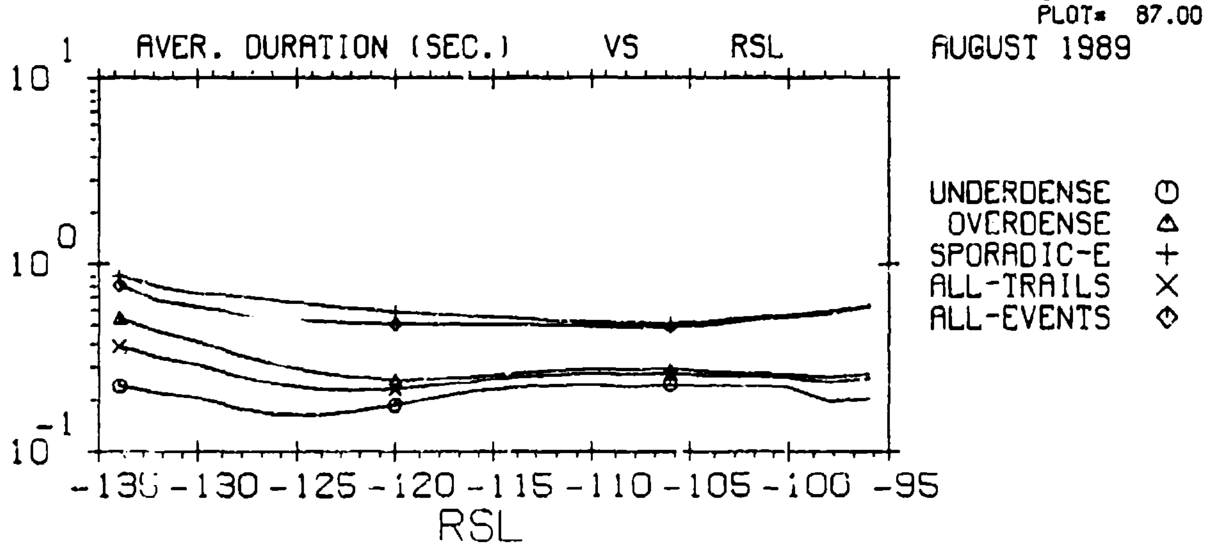
MENU=106,01-4
20-APR-93
PLOT= 86.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 2960. 45MHZ - 2809. 65MHZ - 798.
85MHZ - 553. 104MHZ - 555. 147MHZ - 71.

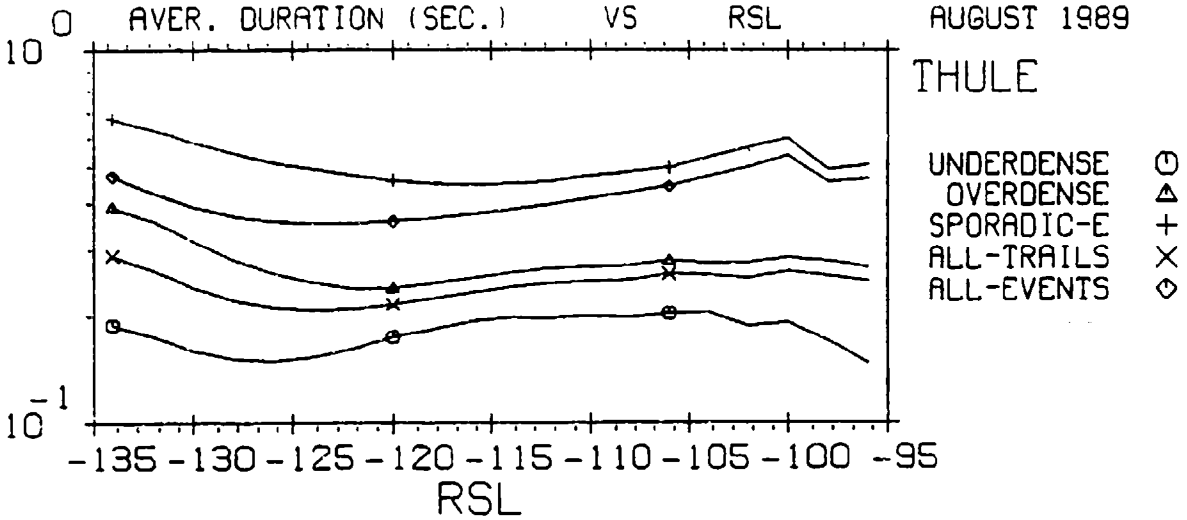
MENU=106,01-4
20-APR-93
PLOT= 87.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

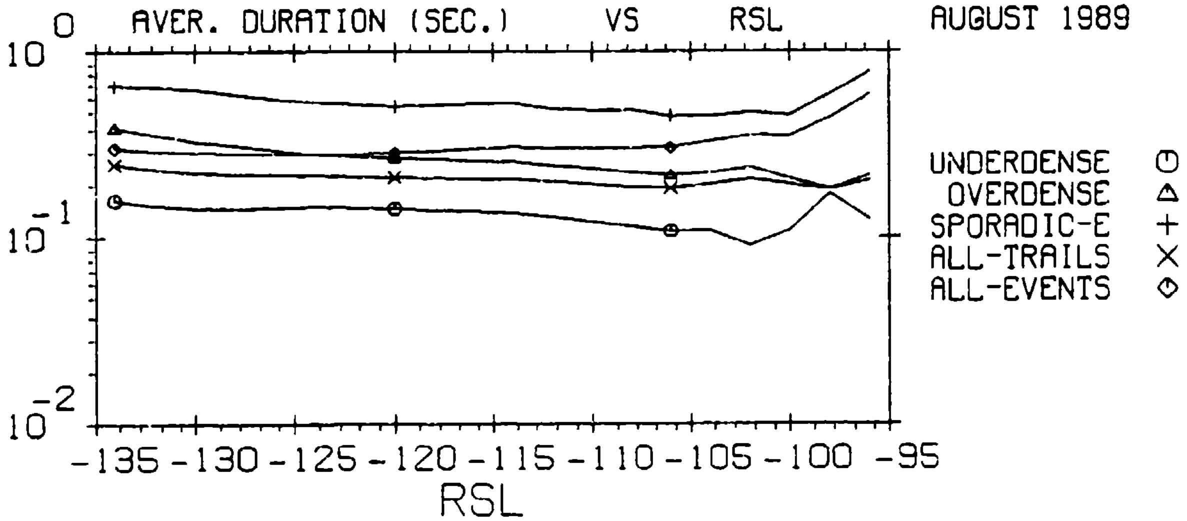
MENU=106,06-1
20-APR-93
PLOT= 88.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

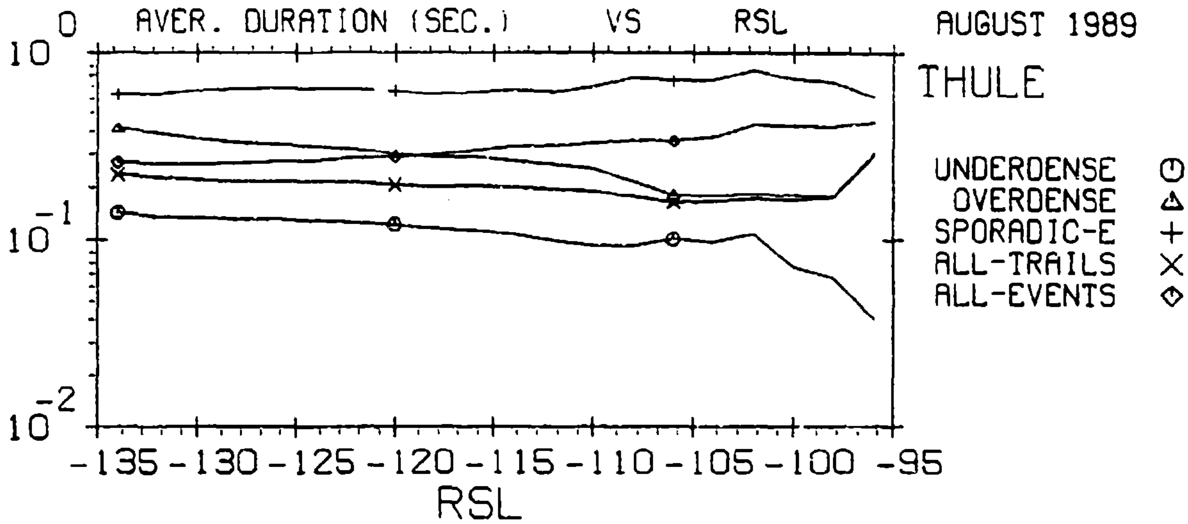
MENU*106,06-1
20-APR-93
PLOT* 89.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

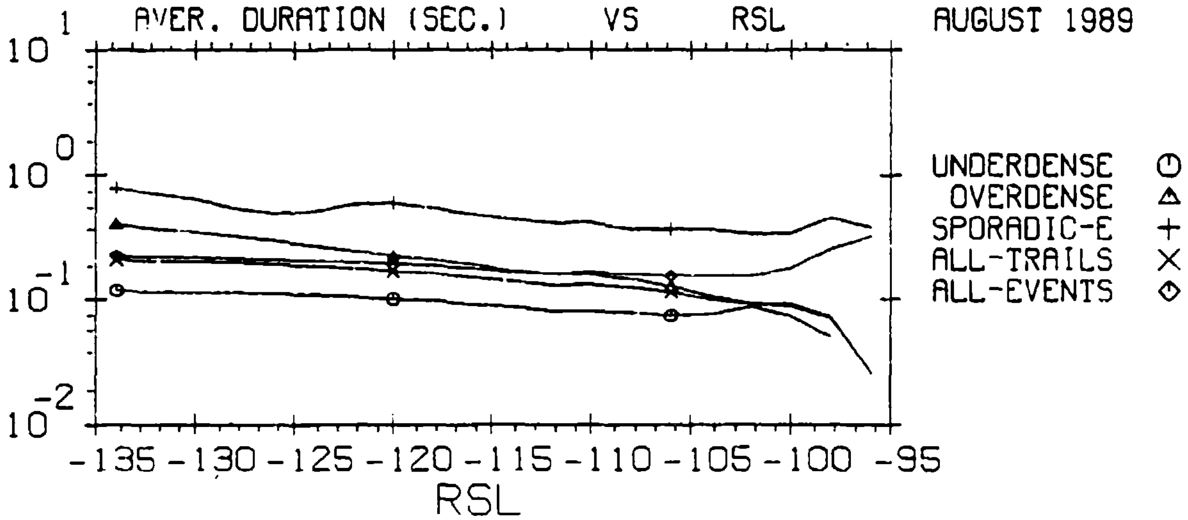
MENU*106,06-1
20-APR-93
PLOT* 90.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

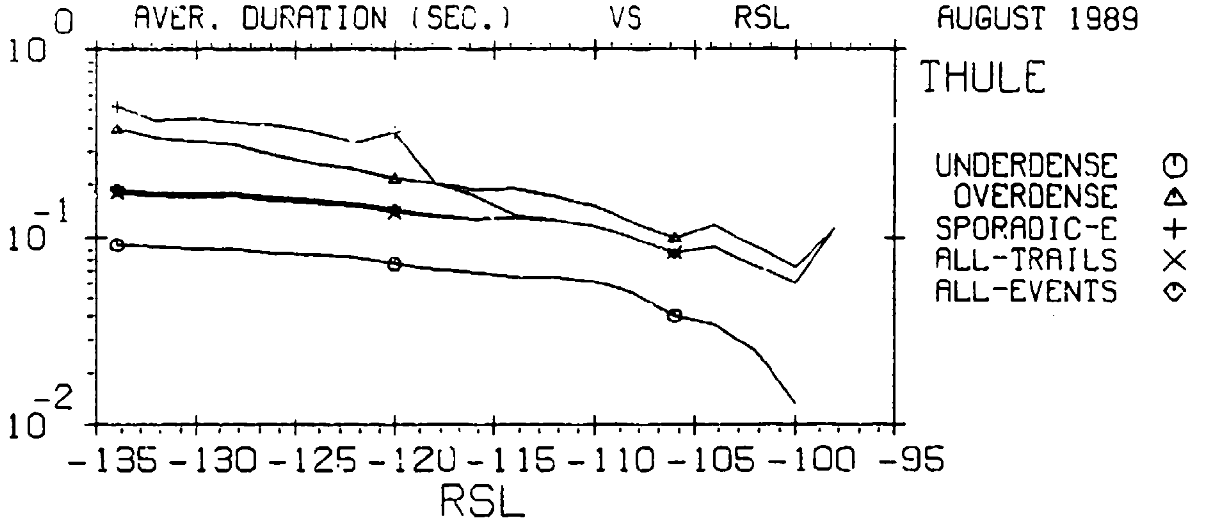
MENU=106,06-1
20-APR-93
PLOT= 91.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

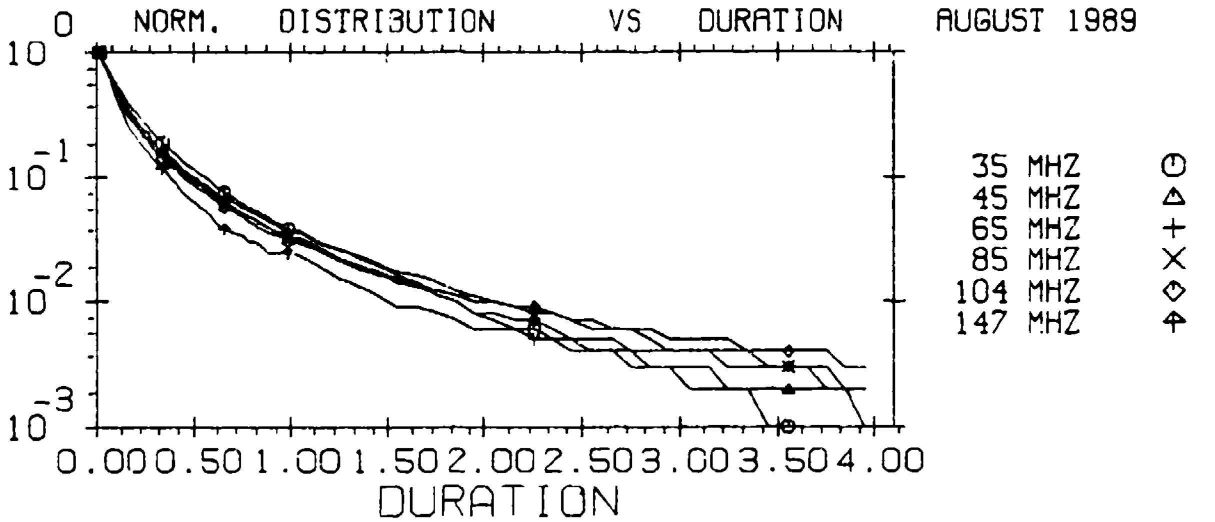
MENU=106,06-1
20-APR-93
PLOT= 92.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

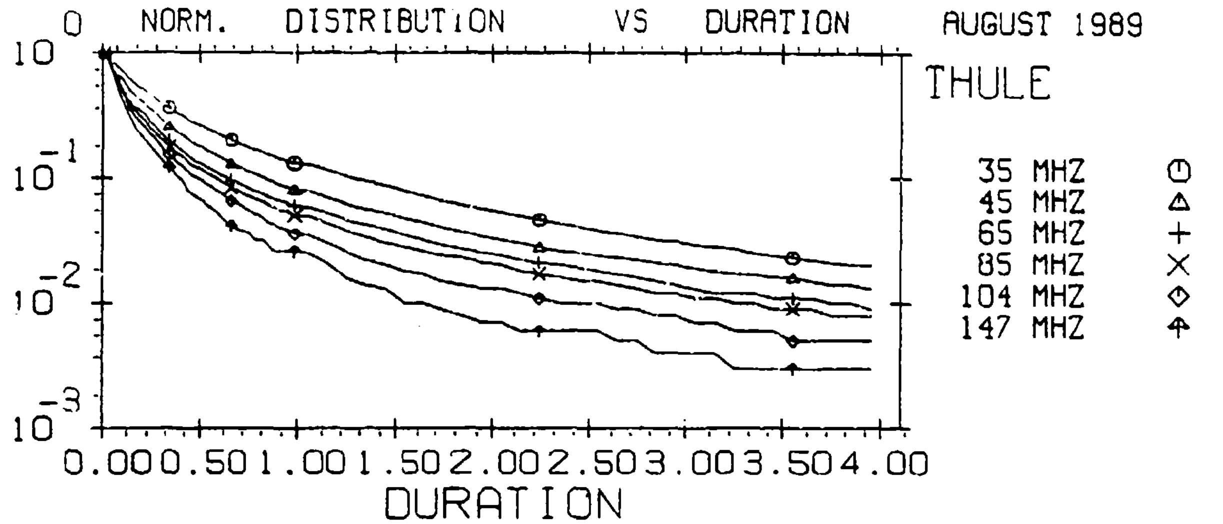
MENU=106,06-1
20-APR-93
PLOT= 93.00




EXCEEDING 19.0 DB SNR
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 23940. 45MHZ - 35252. 65MHZ - 13685.
85MHZ - 9432. 104MHZ - 10849. 147MHZ - 2627.

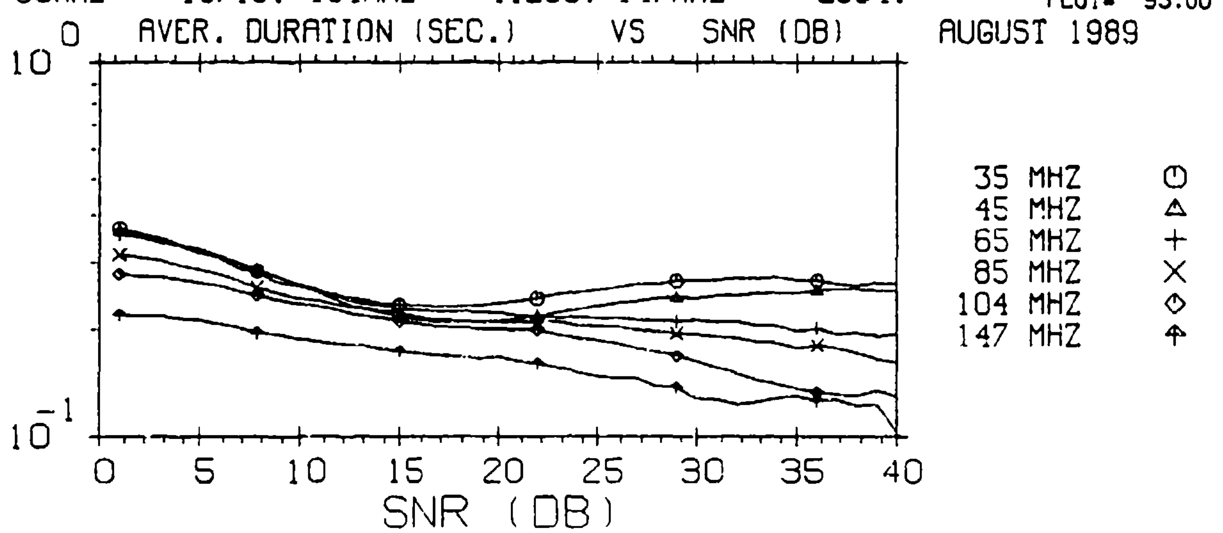
MENU=107,01-4
20-APR-93
PLOT= 94.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING 19.0 DB SNR
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 112523. 45MHZ - 74922. 65MHZ - 16997.
85MHZ - 10718. 104MHZ - 11289. 147MHZ - 2684.

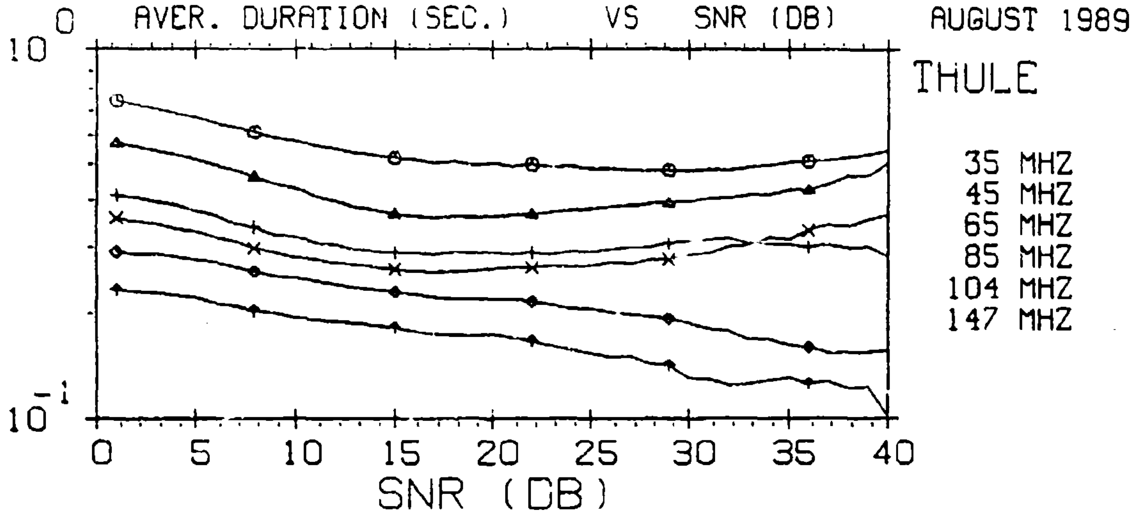
MENU=107,01-4
20-APR-93
PLOT= 95.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

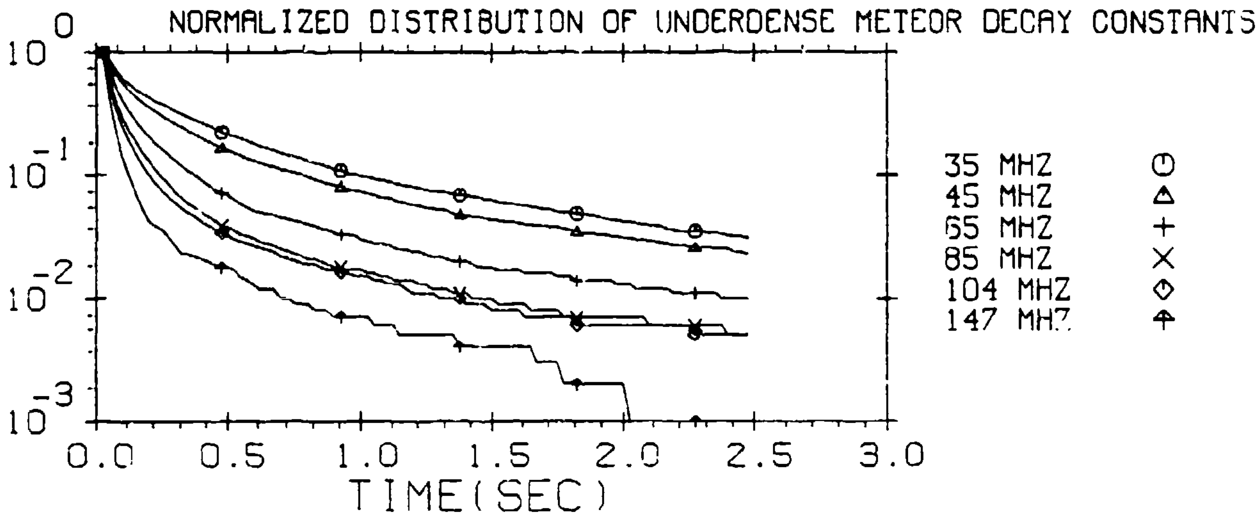
MENU=107,05-1
20-APR-93
PLOT= 96.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

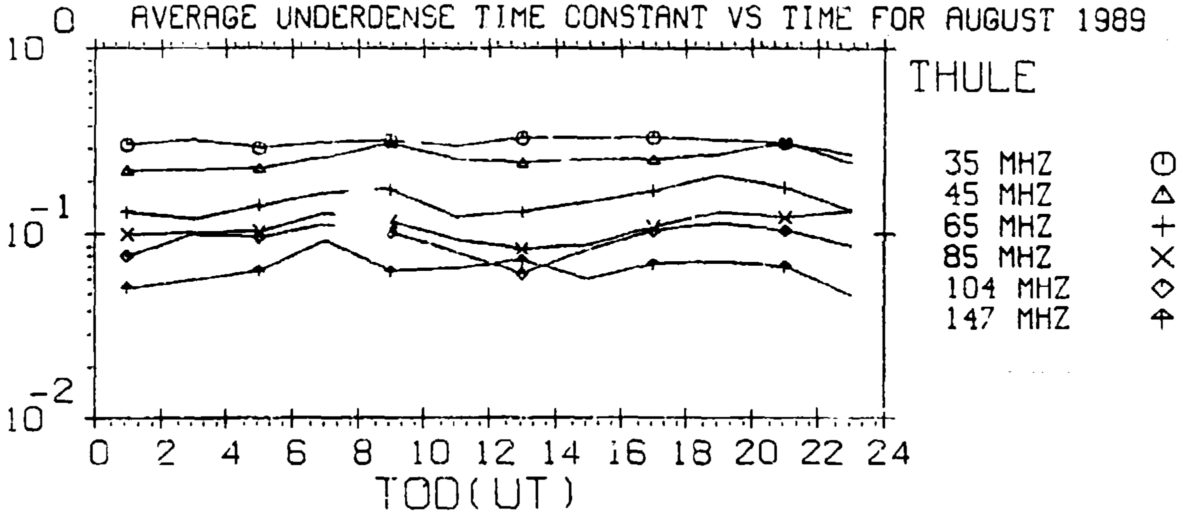
MENU=107,05-1
20-APR-93
PLOT= 97.00




AUGUST 1989
THE TIME OF DAY IS 0 : 24 HOURS U.T.
NORMALIZING FACTORS:
35MHZ : 10282. 45MHZ : 14771. 65MHZ : 10764.
85MHZ : 8301. 104MHZ : 9852. 147MHZ : 2409.

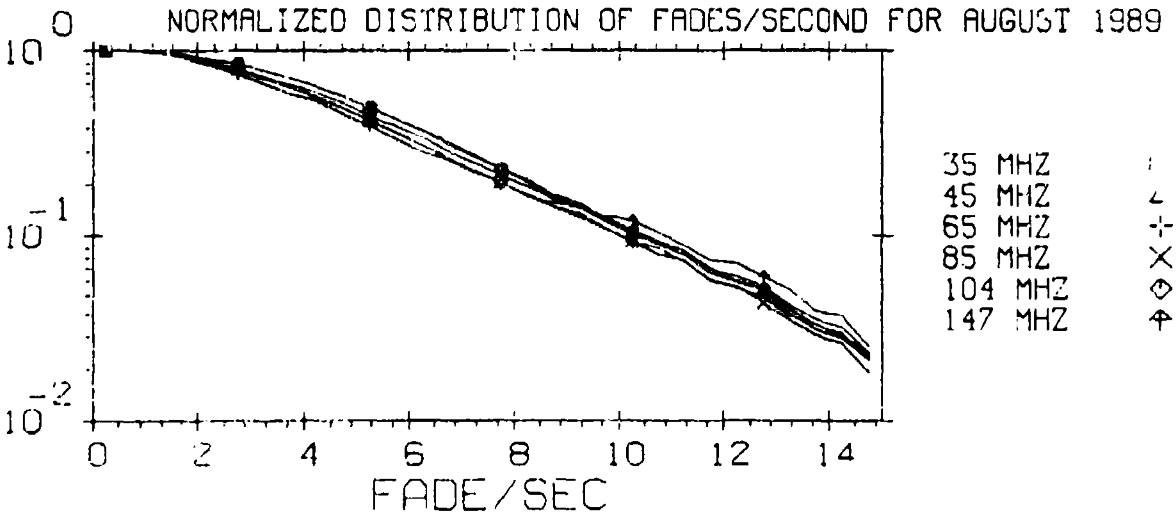
MENU=108,01-4
20-APR-93
PLOT= 98.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE 24 HOUR AVERAGE TIME CONSTANTS ARE
0.305 0.248 0.150 0.107 0.094 0.066

MENU=108,02-1
20-APR-93
PLOT= 99.00

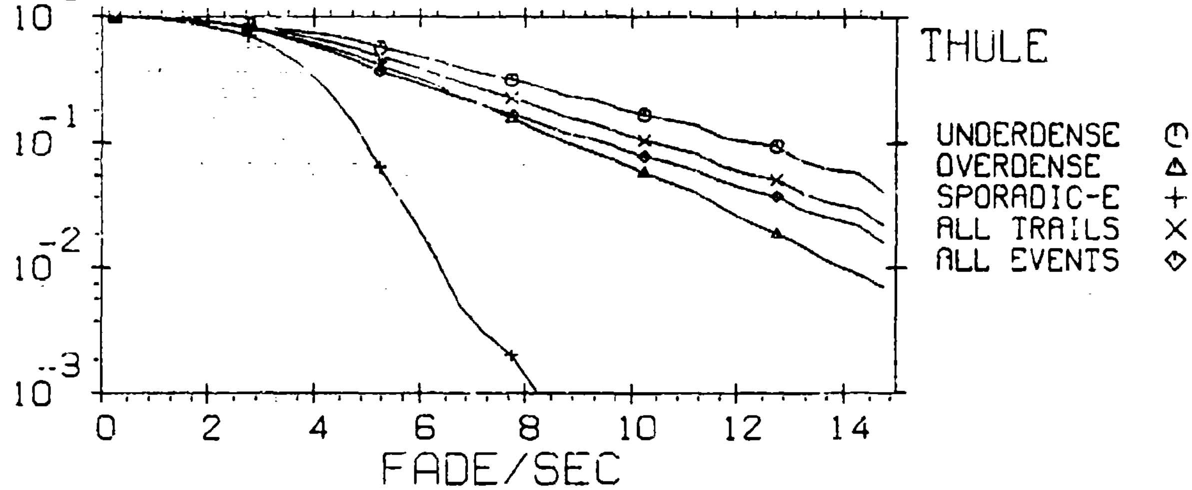



THE TIME OF DAY IS 0 : 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
NORMALIZING FACTORS:
35MHZ 12839. 45MHZ : 14968. 65MHZ : 55[illegible].
85MHZ : 2935. 104MHZ : 3027. 147MHZ : 434.

MENU=109,01-4
20-APR-93
PLOT= 100.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

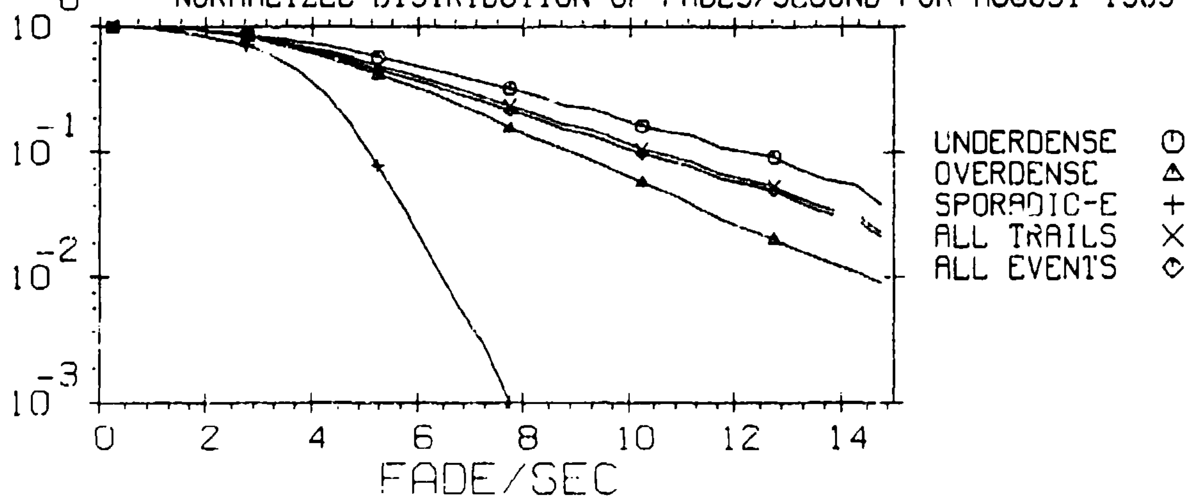
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR AUGUST 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 35 MHZ
NORMALIZING FACTORS:
UNDER : 5554. OVER : 7285. SPOR-E : 4461.
TRAILS : 12839. EVENTS : 17300.

MENU=109,02-4
20-APR-93
PLOT= 101.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR AUGUST 1989

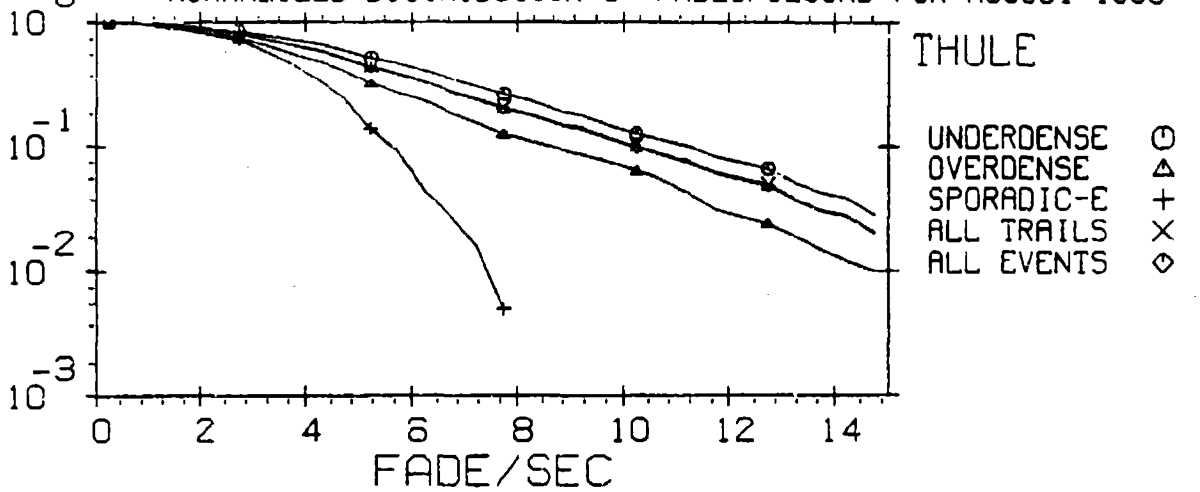



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 45 MHZ
NORMALIZING FACTORS:
UNDER : 7104. OVER : 7864. SPOR-E : 1445.
TRAILS : 14968. EVENTS : 16413.

MENU=109,02-4
20-APR-93
PLOT= 102.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

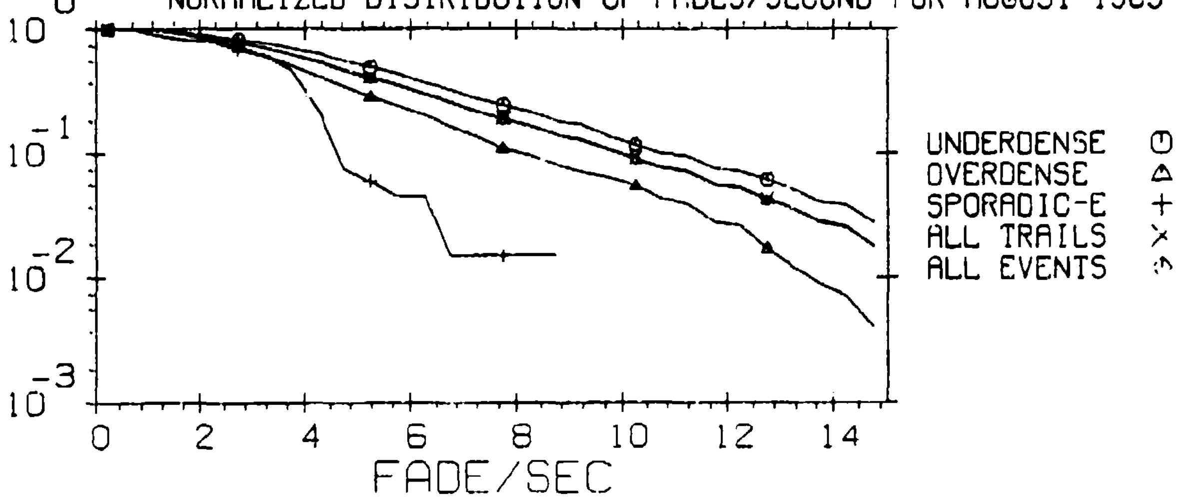
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR AUGUST 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 65 MHZ
NORMALIZING FACTORS:
UNDER : 3331. OVER : 2170. SPOR-E : 187.
TRAILS : 5501. EVENTS : 5688.

MENU=109,02-4
20-APR-93
PLOT= 103.00

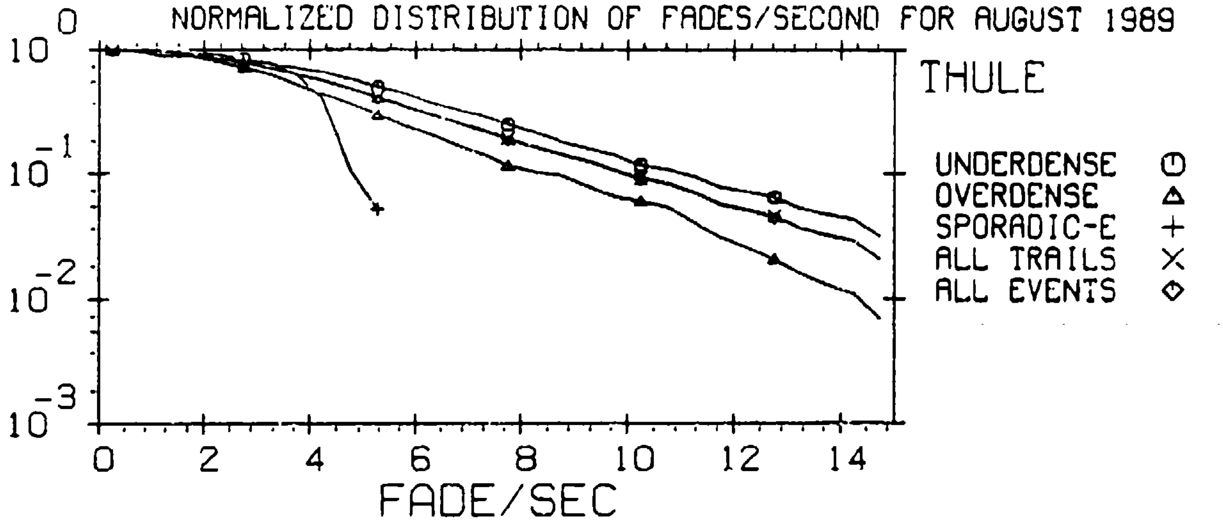
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR AUGUST 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 85 MHZ
NORMALIZING FACTORS:
UNDER : 1765. OVER : 1170. SPOR-E : 67.
TRAILS : 2935. EVENTS : 3002.

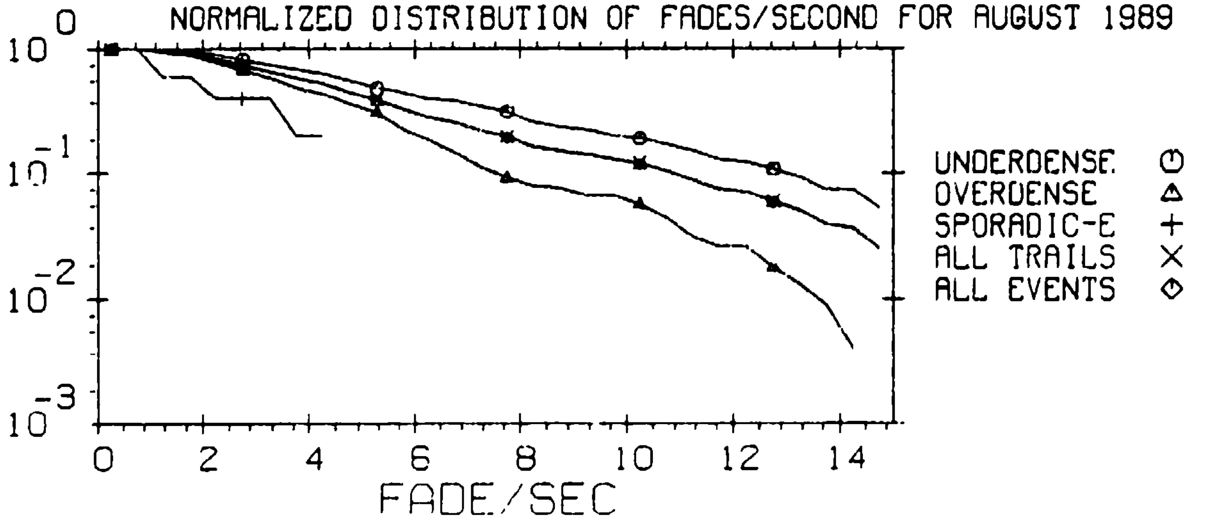
MENU=109,02-4
20-APR-93
PLOT= 104.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 104 MHZ
NORMALIZING FACTORS:
UNDER : 1740. OVER : 1287. SPOR-E : 58.
TRAILS : 3027. EVENTS : 3085.

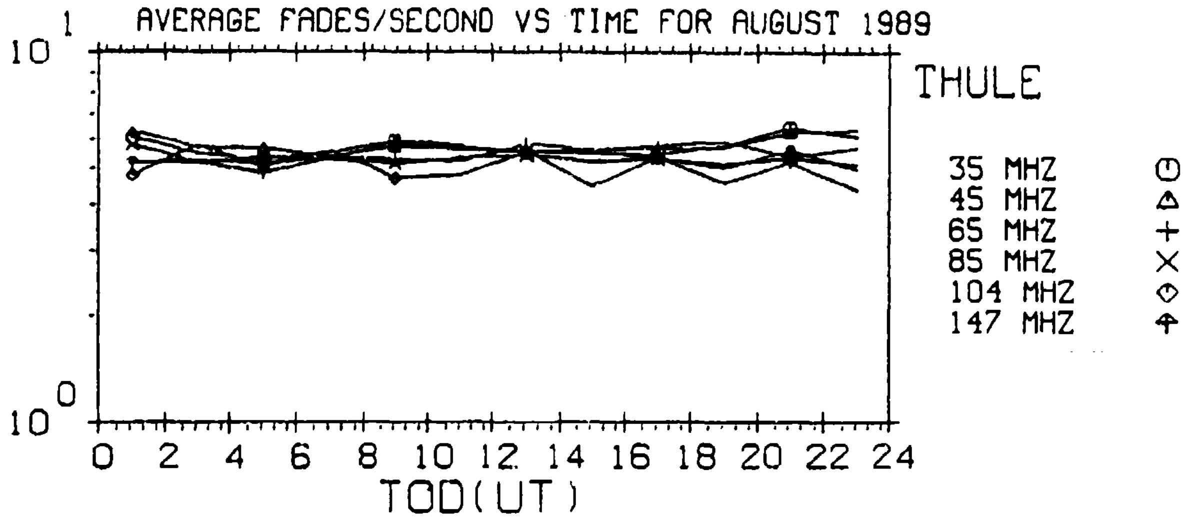
MENU=109,02-4
20-APR-93
PLOT= 105.00




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 147 MHZ
NORMALIZING FACTORS:
UNDER : 206. OVER : 228. SPOR-E : 5.
TRAILS : 434. EVENTS : 439.

MENU=109,02-4
20-APR-93
PLOT= 106.00

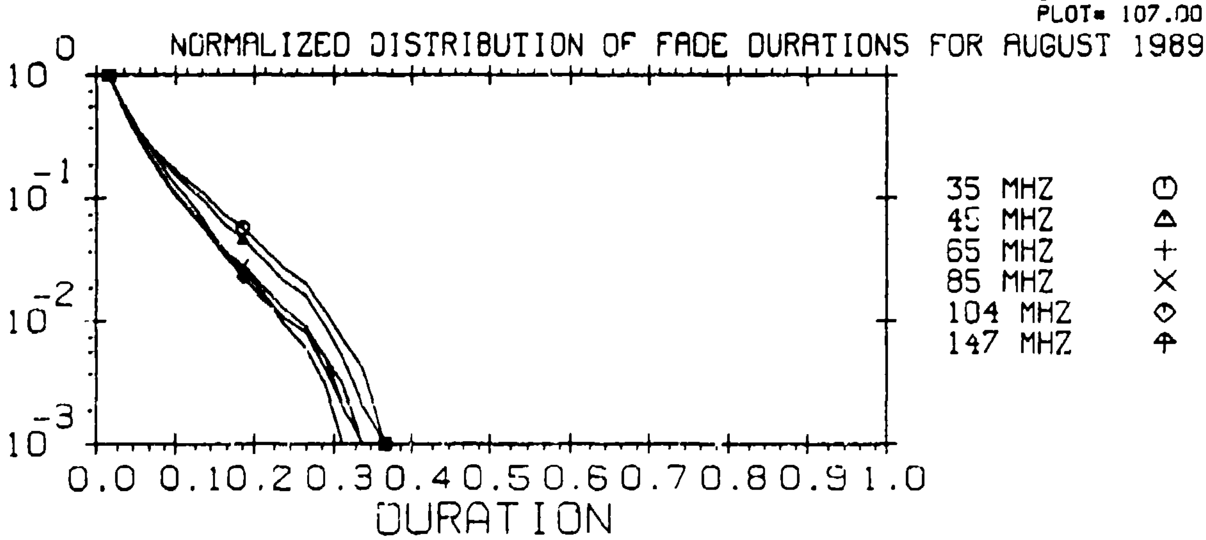
GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
THE 24 HOUR FADES/SECOND AVERAGES ARE:

| | | | | | |
|---|---|---|---|---|---|
| 5.571 | 5.613 | 5.318 | 5.138 | 5.124 | 5.059 |

MENU=109,07-1
20-APR-93
PLOT= 107.00



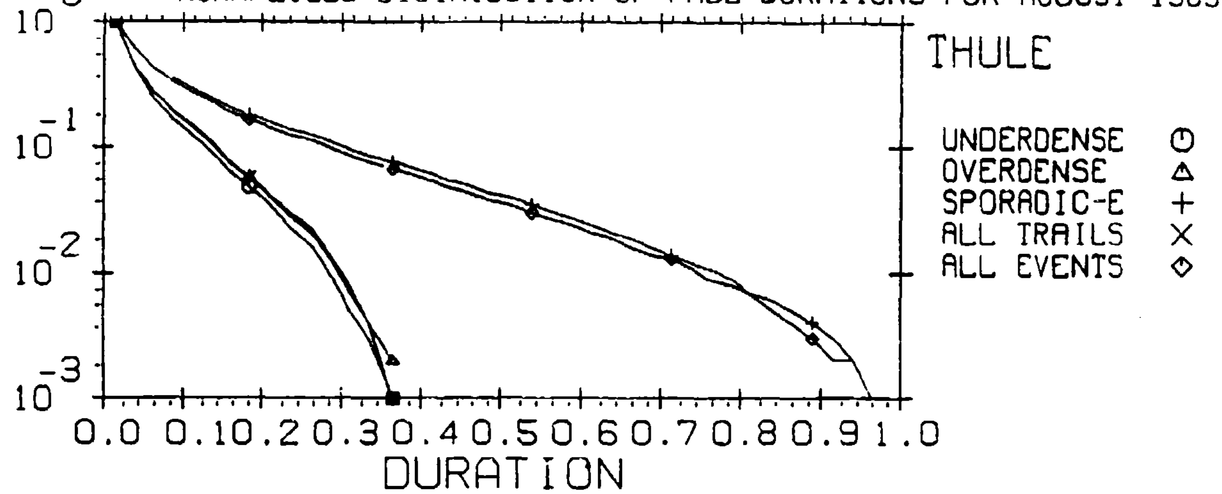

THE TIME OF DAY IS 0 : 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
NORMALIZING FACTORS:

| | | | | | |
|---|---|---|---|---|---|
| 35MHZ : | 60468. | 45MHZ : | 71223. | 65MHZ : | 26644. |
| 85MHZ : | 13671. | 104MHZ : | 15077. | 147MHZ : | 2892. |

MENU=109,05-4
20-APR-93
PLOT= 108.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

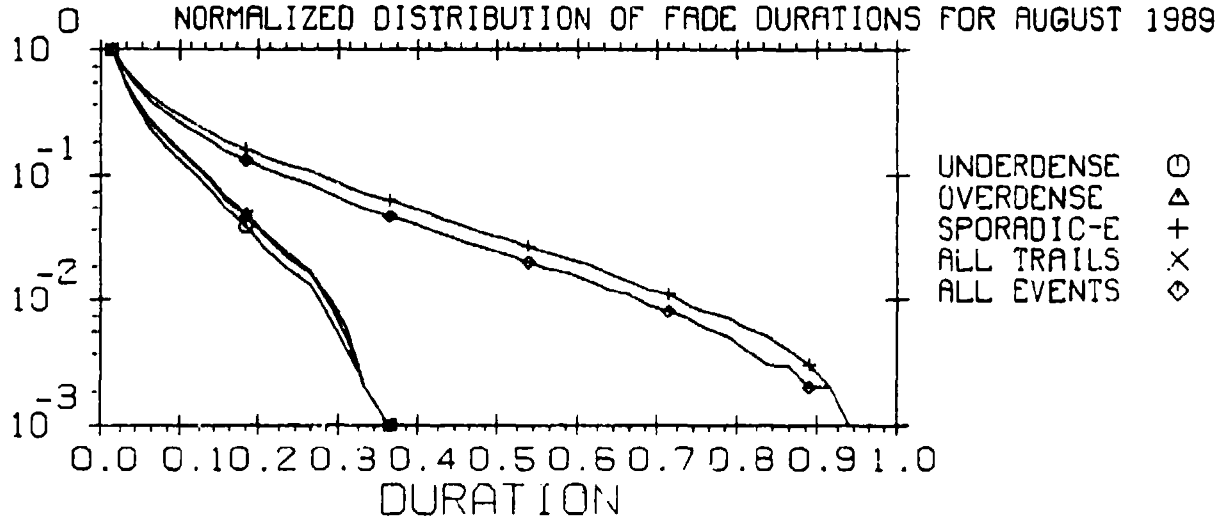
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR AUGUST 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 35 MHZ
NORMALIZING FACTORS:
UNDER : 15902. OVER : 44566. SPOR-E : 440284.
TRAILS : 60468. EVENTS : 500752.

MENU= 109,06-4
20-APR-93
PLOT= 109.00

NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR AUGUST 1989

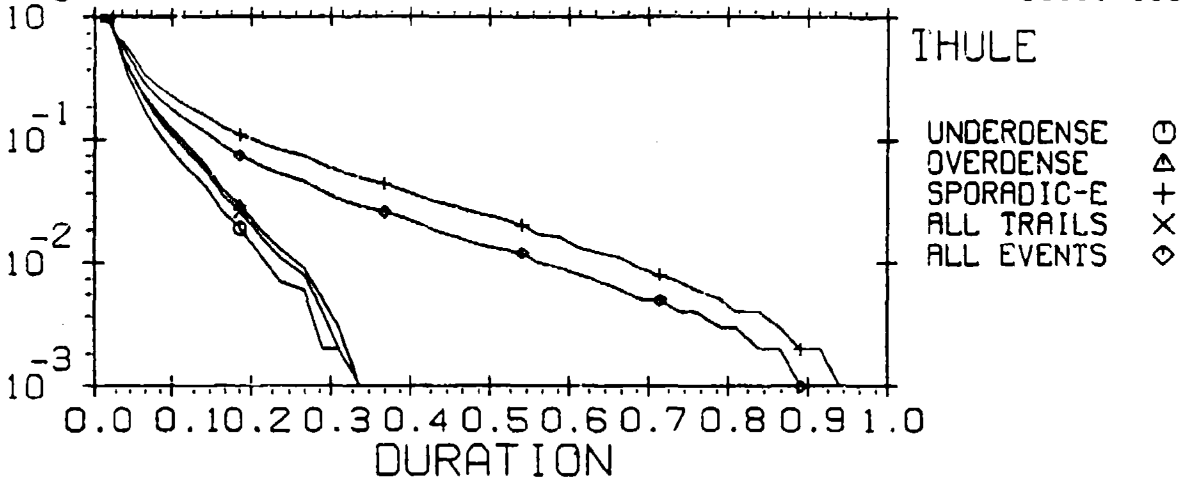



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 45 MHZ
NORMALIZING FACTORS:
UNDER : 19361. OVER : 51862. SPOR-E : 210695.
TRAILS : 71223. EVENTS : 281918.

MENU= 109,06-4
20-APR-93
PLOT= 110.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

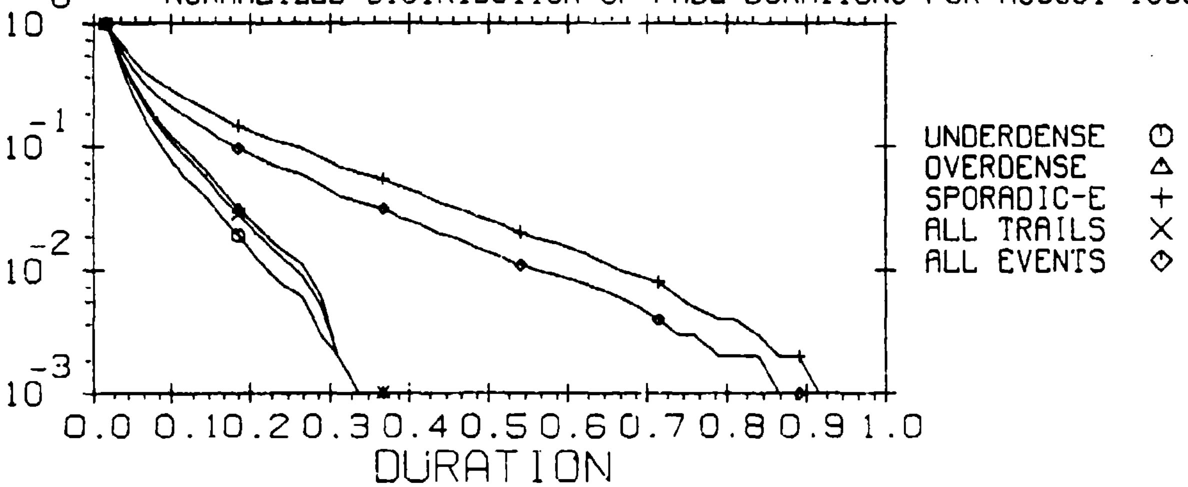
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR AUGUST 1989




THE TIME OF DAY IS  0 : 24 HOURS U.T.
FREQUENCY - 65 MHZ
NORMALIZING FACTORS:
UNDER :  7772.  OVER :  18872. SPOR-E :  36898.
TRAILS :  26644. EVENTS :  63542.

MENU*109,06-4
20-APR-93
PLOT* 111.00

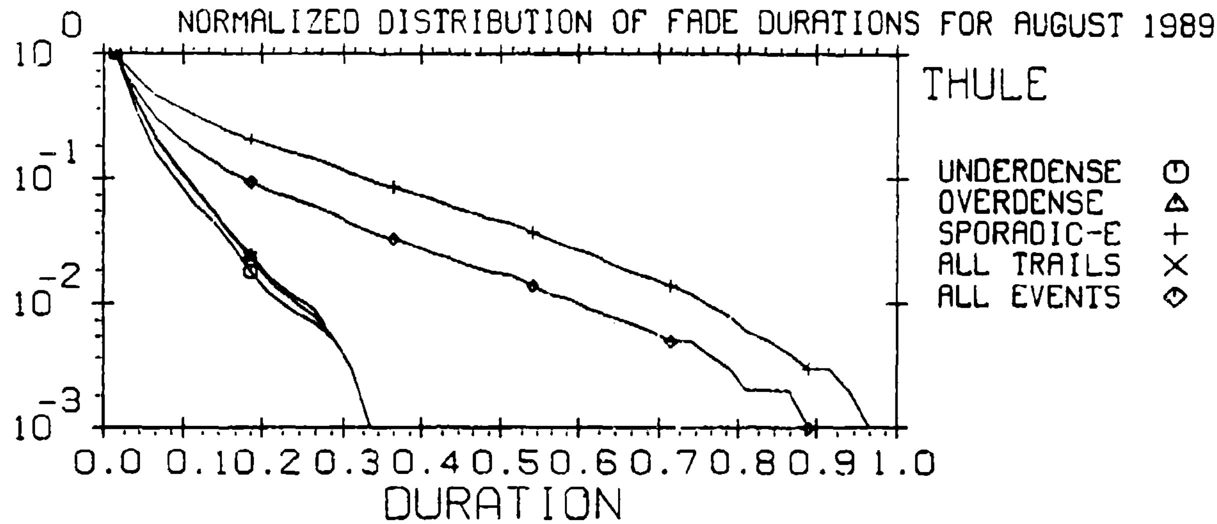
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR AUGUST 1989




THE TIME OF DAY IS  0 : 24 HOURS U.T.
FREQUENCY - 85 MHZ
NORMALIZING FACTORS:
UNDER :  3854.  OVER :  9817. SPOR-E :  17997.
TRAILS :  13671. EVENTS :  31668.

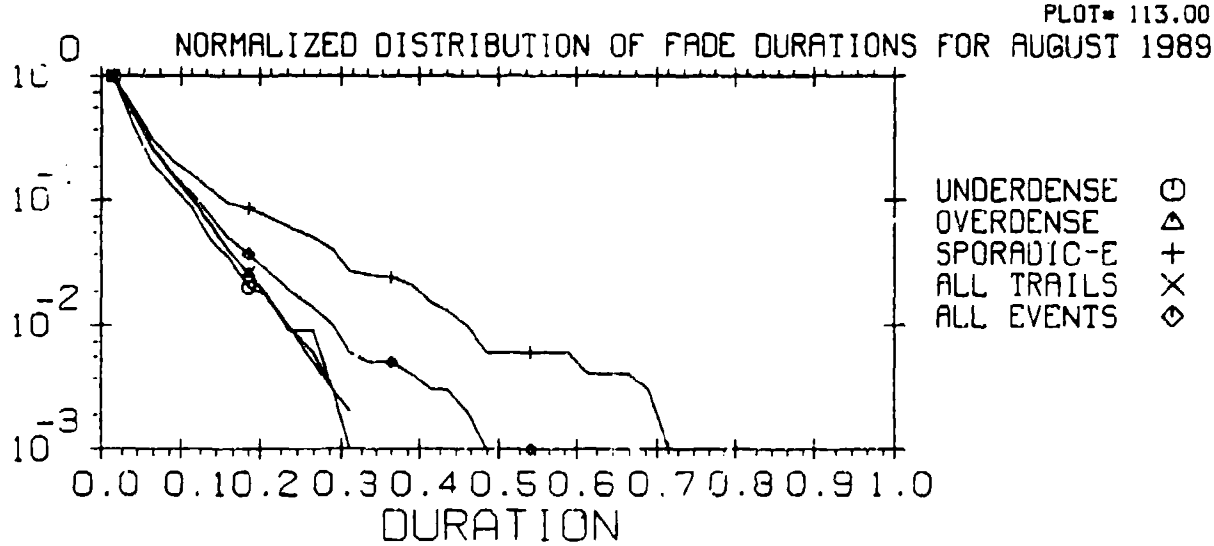
MENU*109,06-4
20-APR-93
PLOT* 112.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM



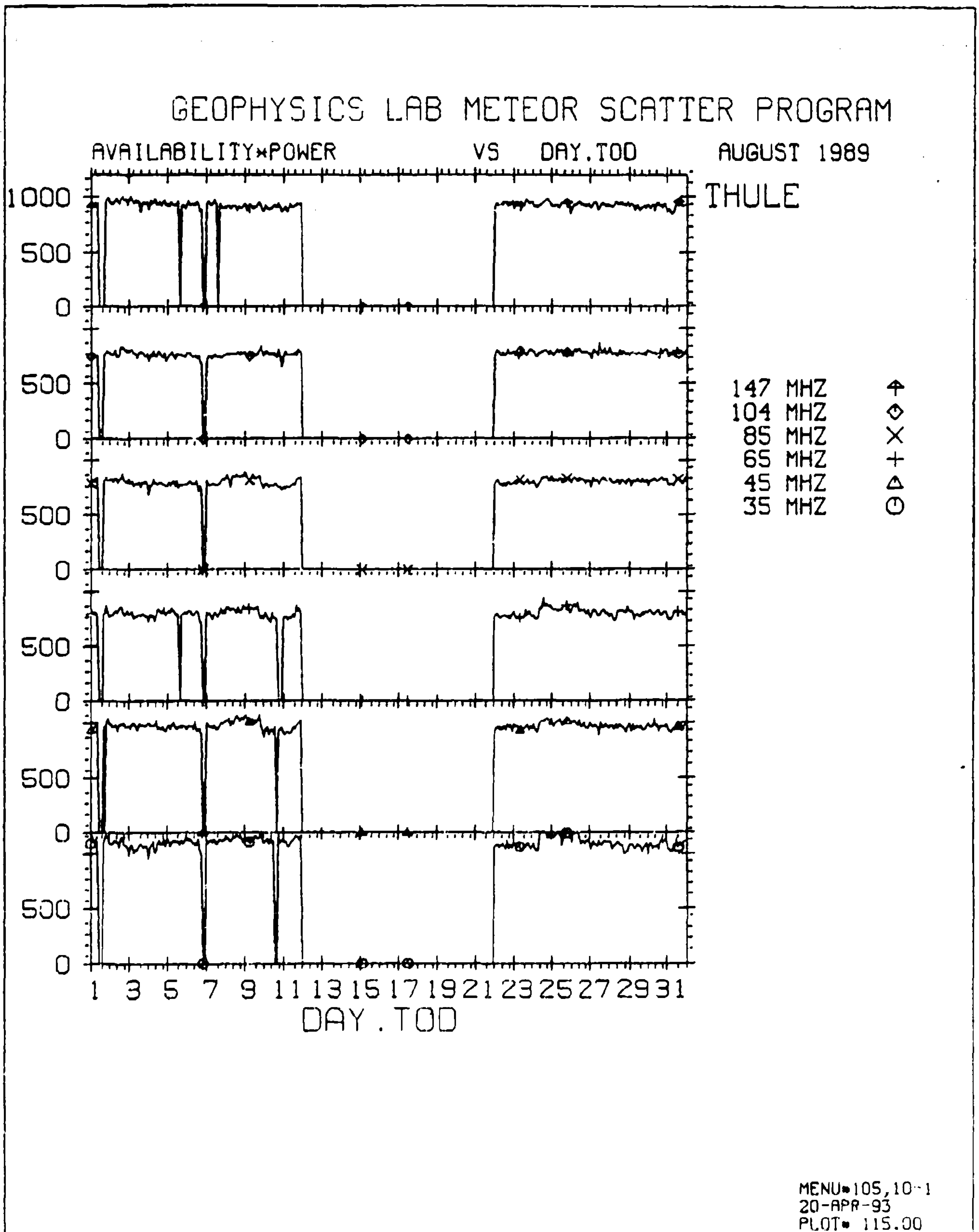

THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 104 MHZ
NORMALIZING FACTORS:
UNDER : 3325. OVER : 11752. SPOR-E : 9193.
TRAILS : 15077. EVENTS : 24270.

MENU=109,06-4
20-APR-93
PLOT= 113.00

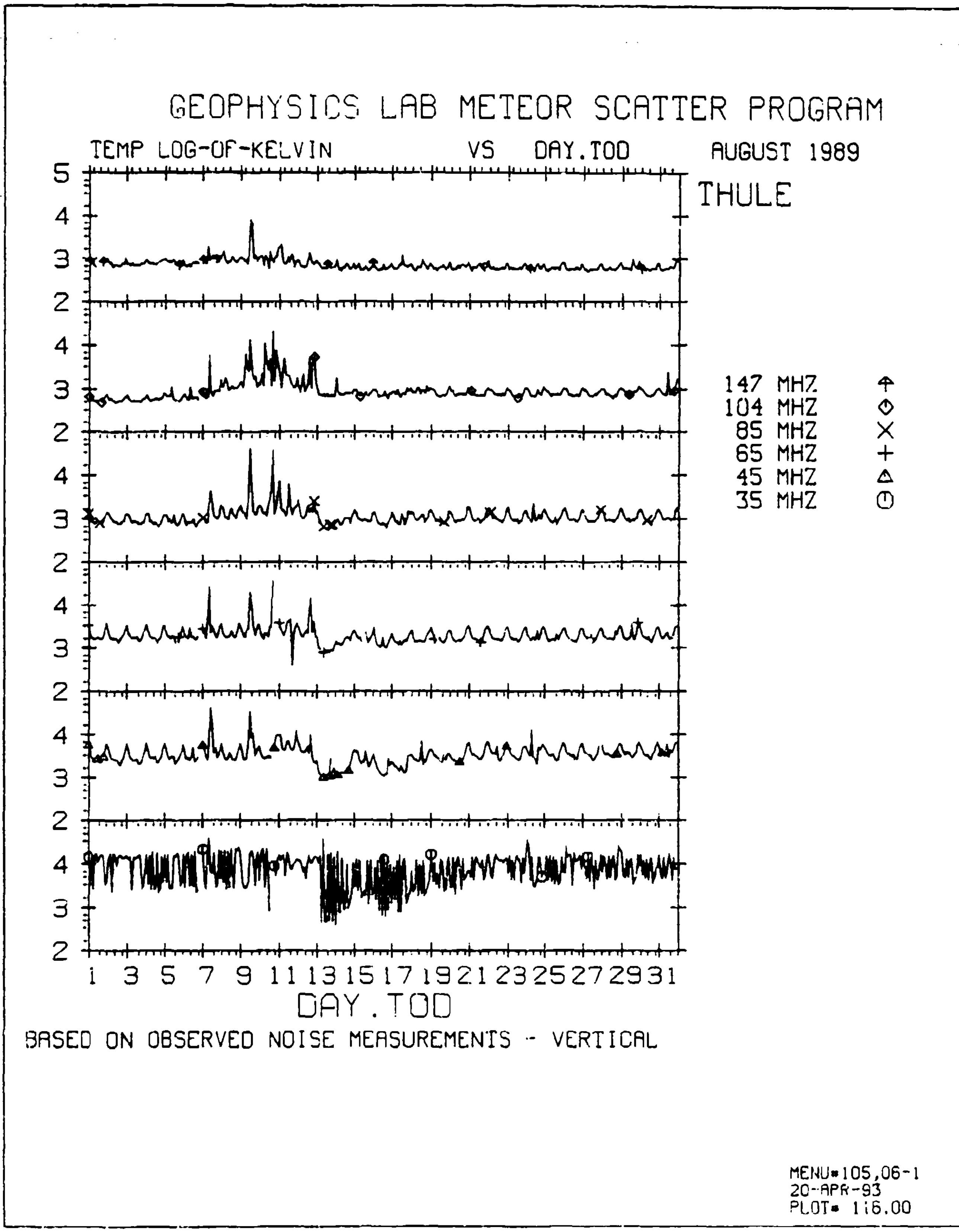


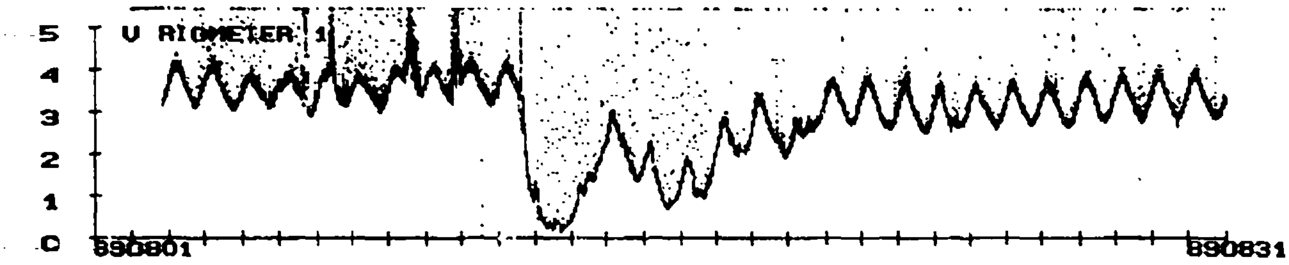

THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 147 MHZ
NORMALIZING FACTORS:
UNDER : 343. OVER : 2549. SPOR-E : 671.
TRAILS : 2892. EVENTS : 3563.

MENU=109,06-4
20-APR-93
PLOT= 114.00



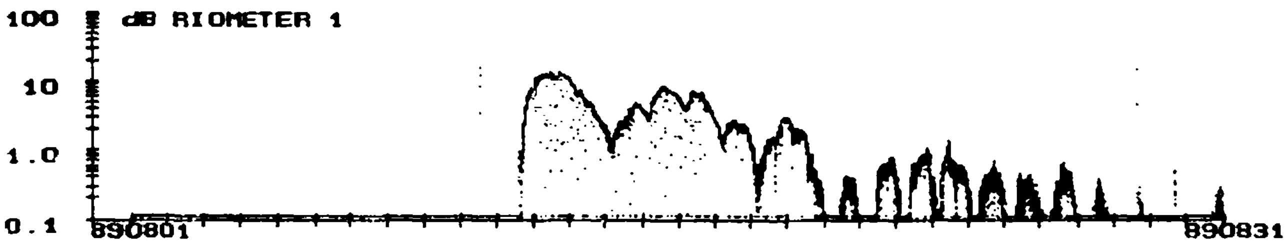
GEOPHYSICS LAB METEOR SCATTER PROGRAM
AVAILABILITY*POWER VS DAY.TOD AUGUST 1989
THULE
1000
500
0
147 MHZ
104 MHZ
85 MHZ
65 MHZ
45 MHZ
35 MHZ
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
DAY.TOD
MENU=105,10-1
20-APR-93
PLOT= 115.00


GEOPHYSICS LAB METEOR SCATTER PROGRAM
TEMP LOG-OF-KELVIN VS DAY.TOD AUGUST 1989
THULE
147 MHZ
104 MHZ
85 MHZ
65 MHZ
45 MHZ
35 MHZ
DAY.TOD
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
MENU=105,06-1
20-APR-93
PLOT= 116.00



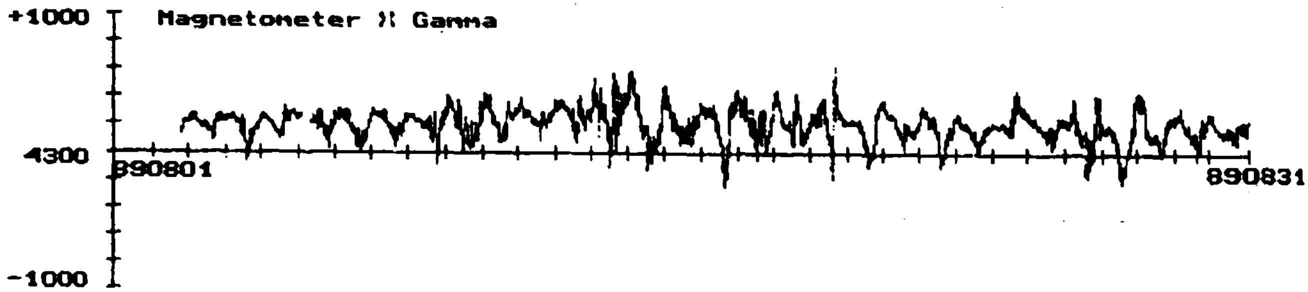

PLOT 117

PLOT 118 RIOMETER 2 DATA UNAVAILABLE

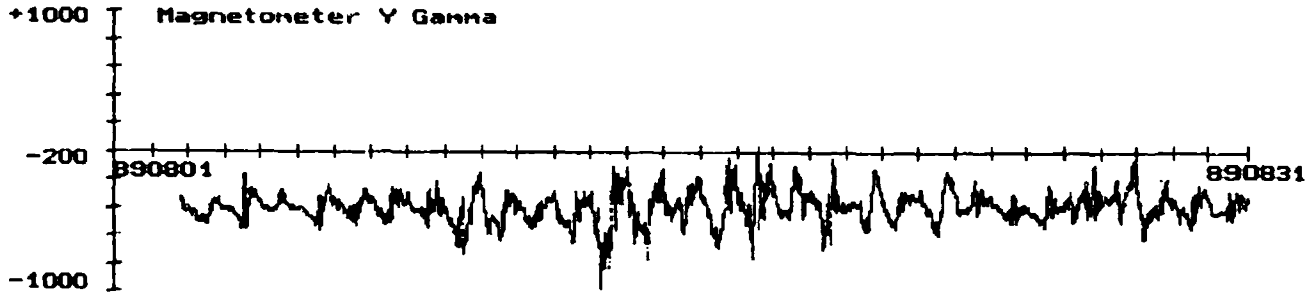



PLOT 119

PLOT 120 RIOMETER 2 DATA UNAVAILABLE




PLOT 121



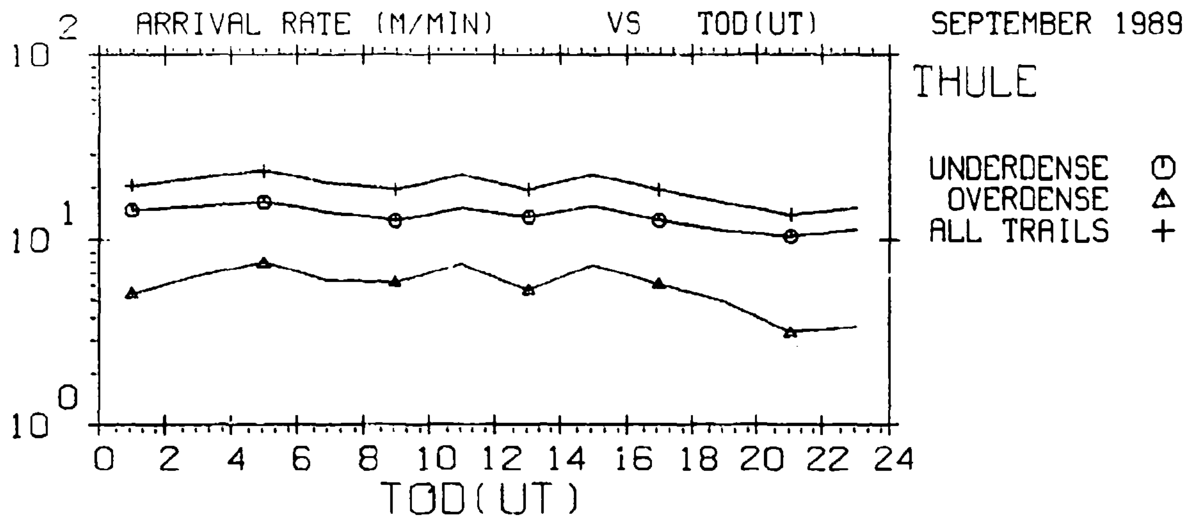

PLOT 122


PLOT 123

# APPENDIX B

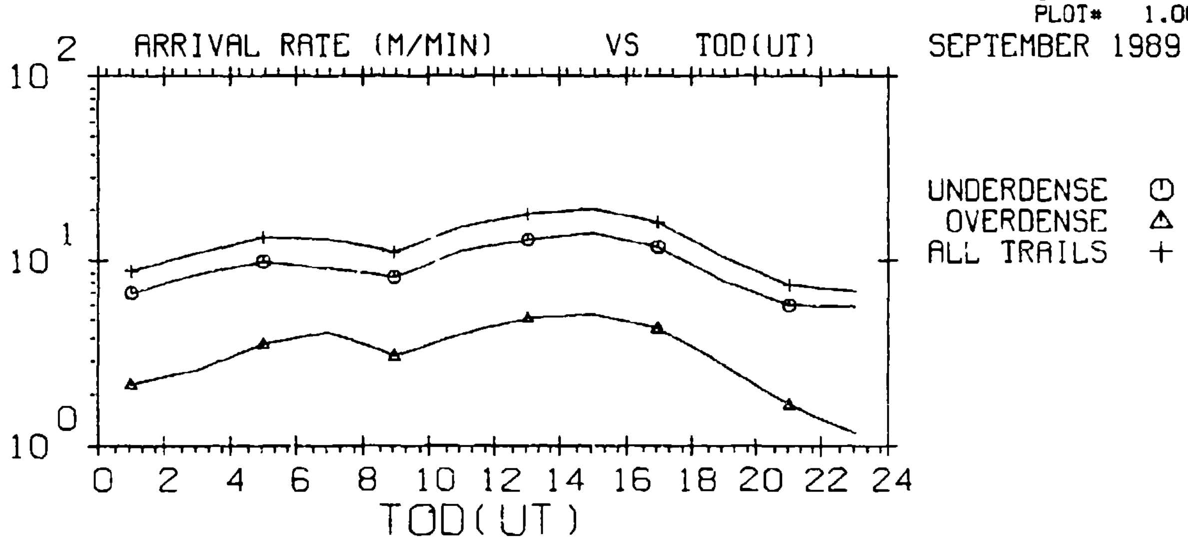
## STATISTICS FOR SEPTEMBER 1989

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

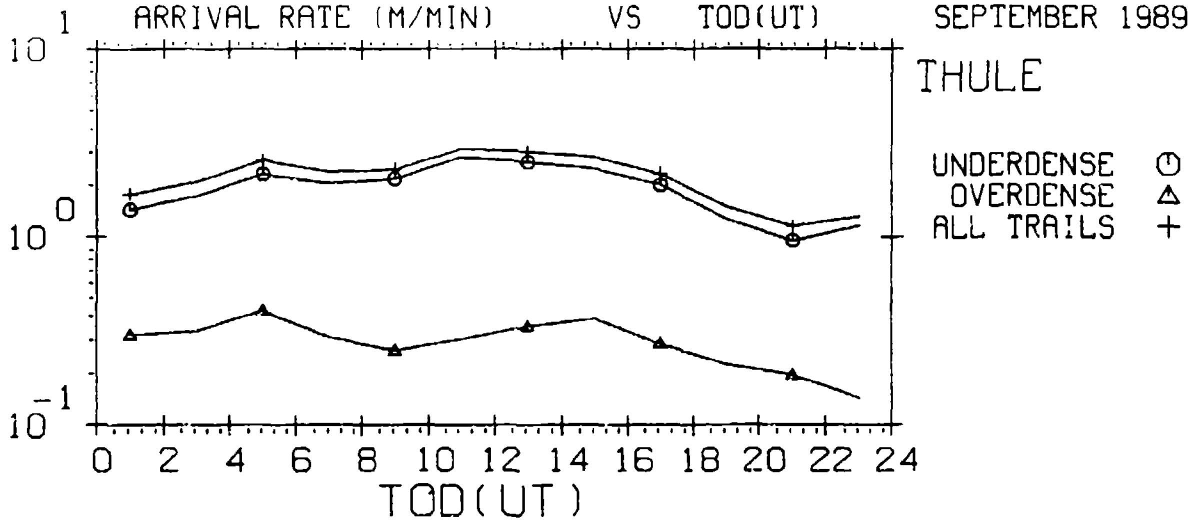
MENU#101,05-2
14-JUN-93
PLOT# 1.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

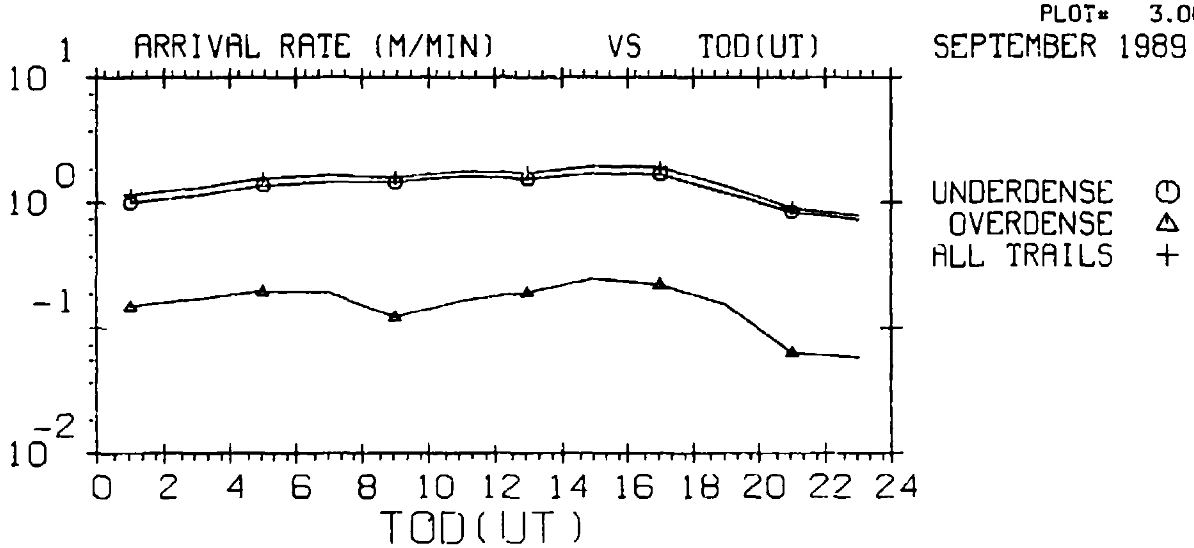
MENU#101,05-2
14-JUN-93
PLOT# 2.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

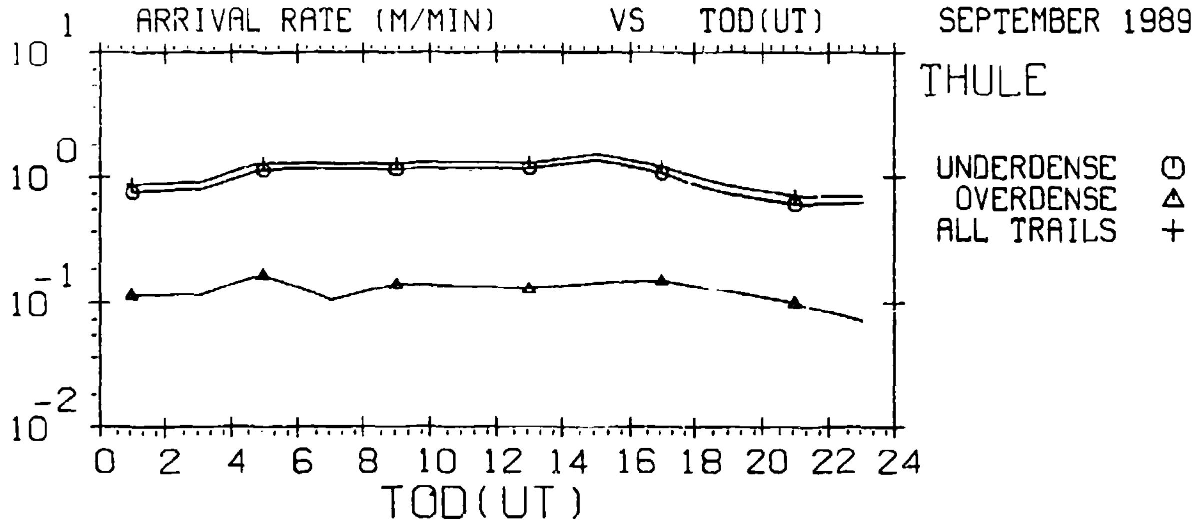
MENU*101,05-2
14-JUN-93
PLOT* 3.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

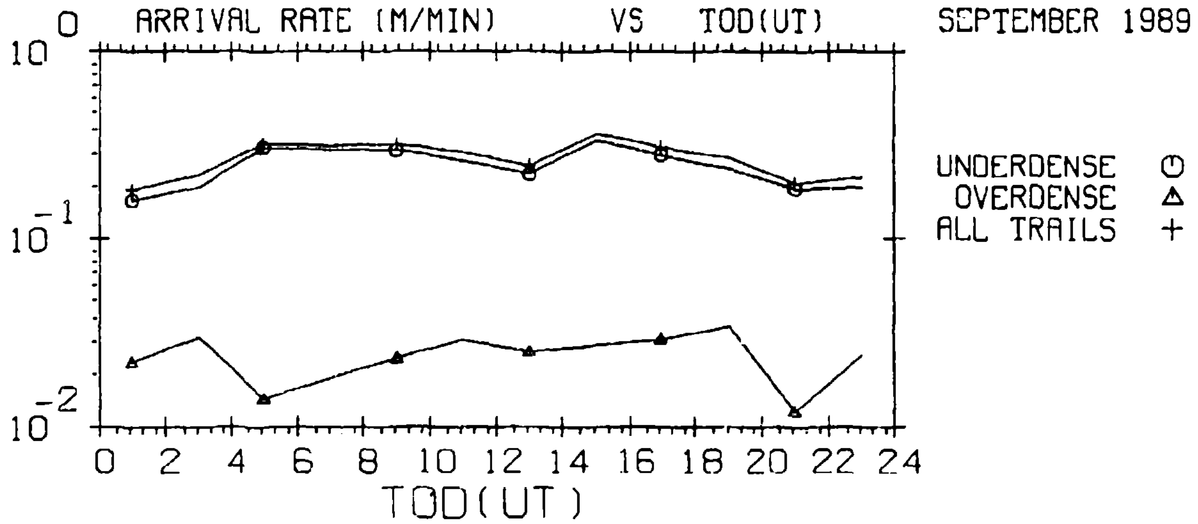
MENU*101,05-2
14-JUN-93
PLOT* 4.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

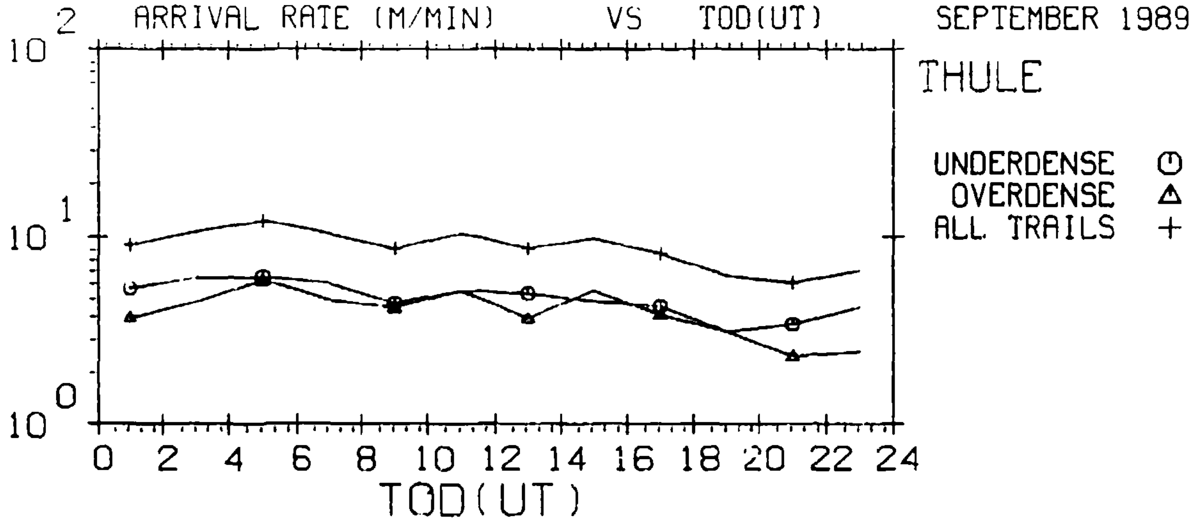
MENU#101,05-2
14-JUN-93
PLOT# 5.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

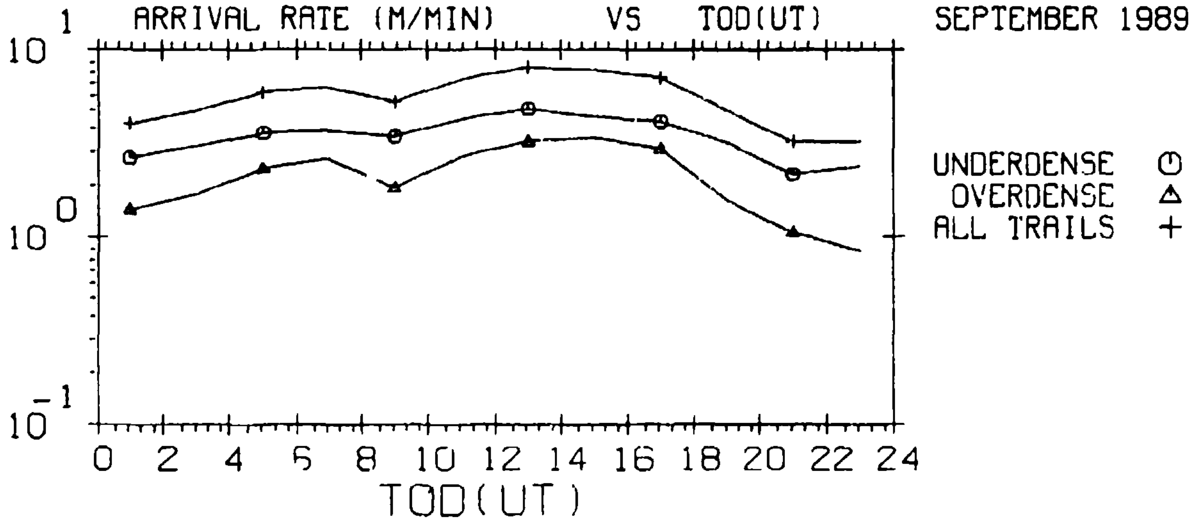
MENU#101,05-2
14-JUN-93
PLOT# 6.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

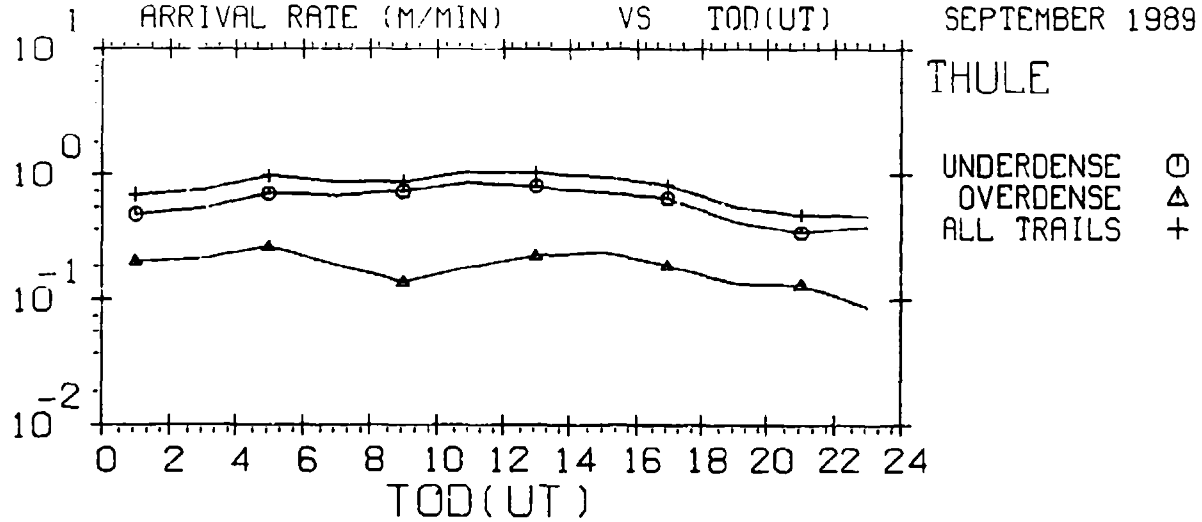
MENU*101,05-2
14-JUN-93
PLOT* 7.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

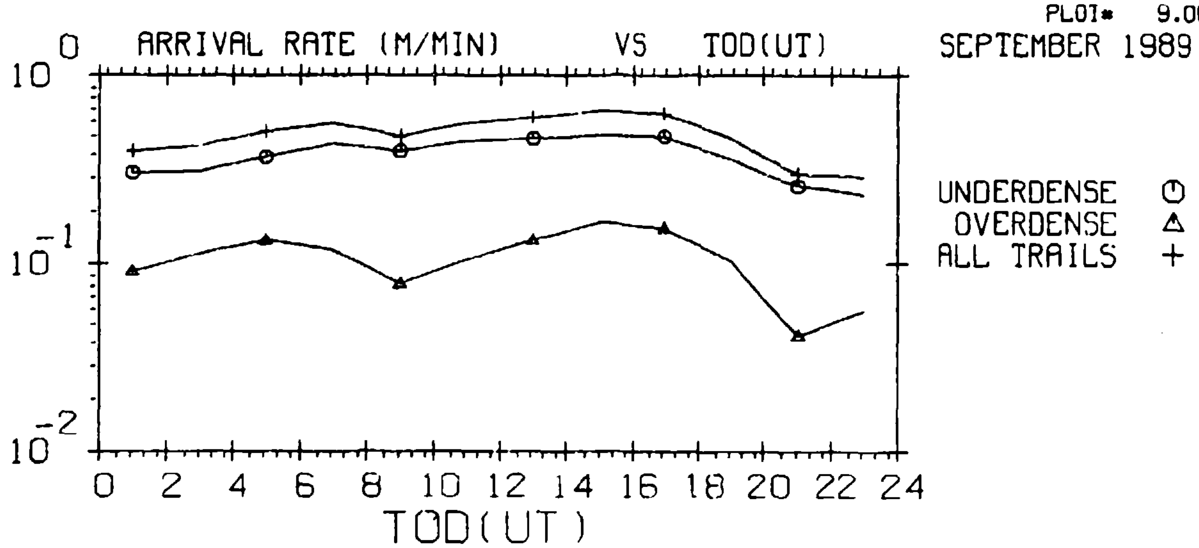
MENU*101,05-2
14-JUN-93
PLOT* 8.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

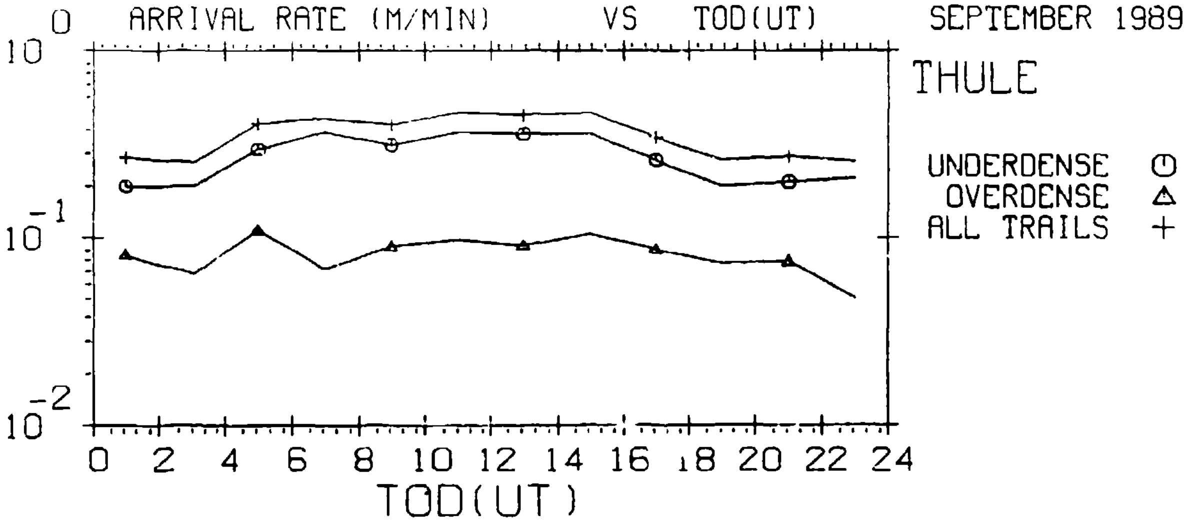
MENU#101,05-2
14-JUN-93
PLOT# 9.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

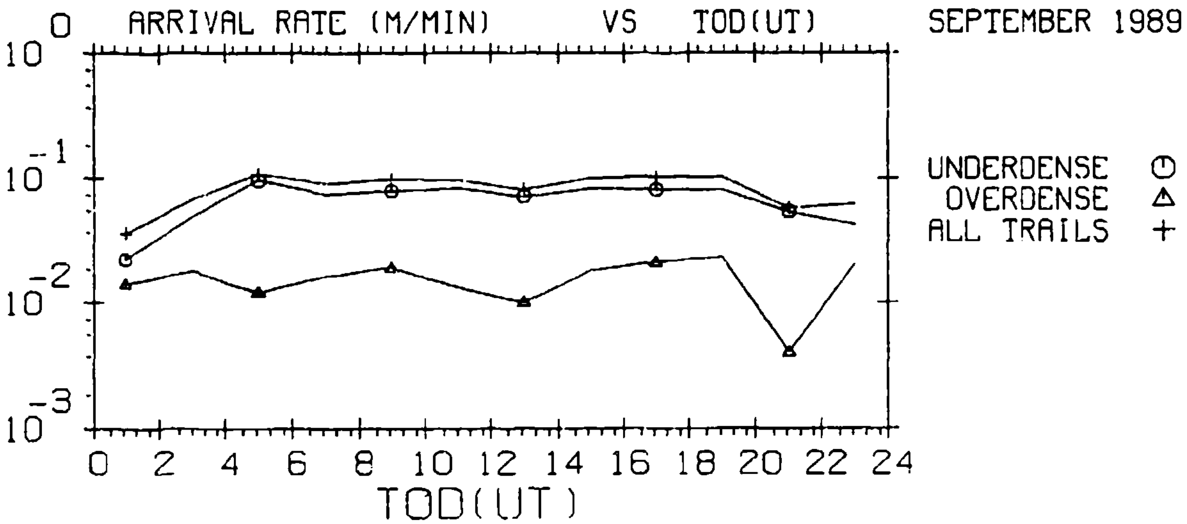
MENU#101,05-2
14-JUN-93
PLOT# 10.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

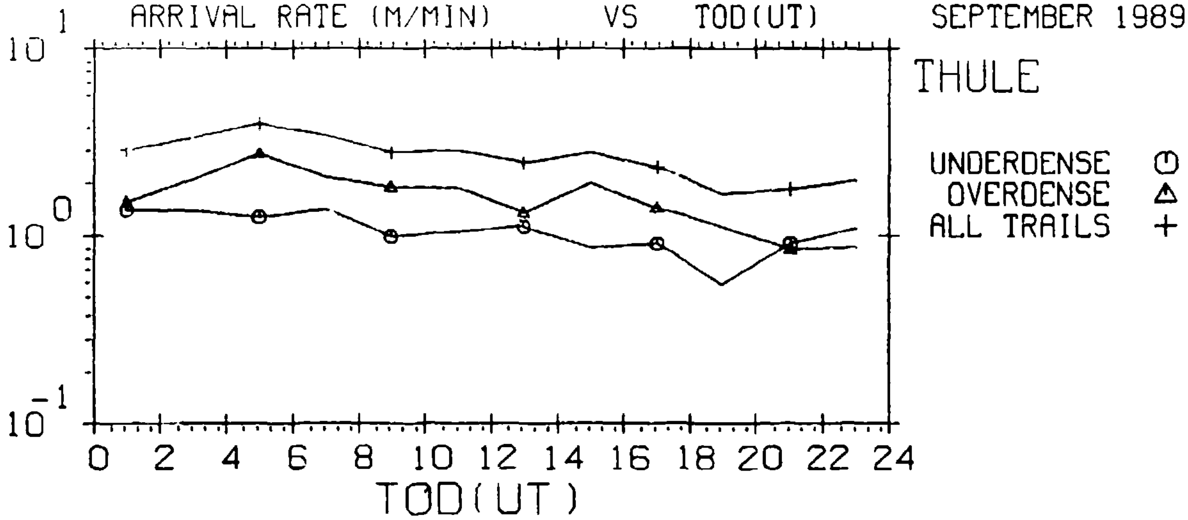
MENU#101,05-2
14-JUN-93
PLOT# 11.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

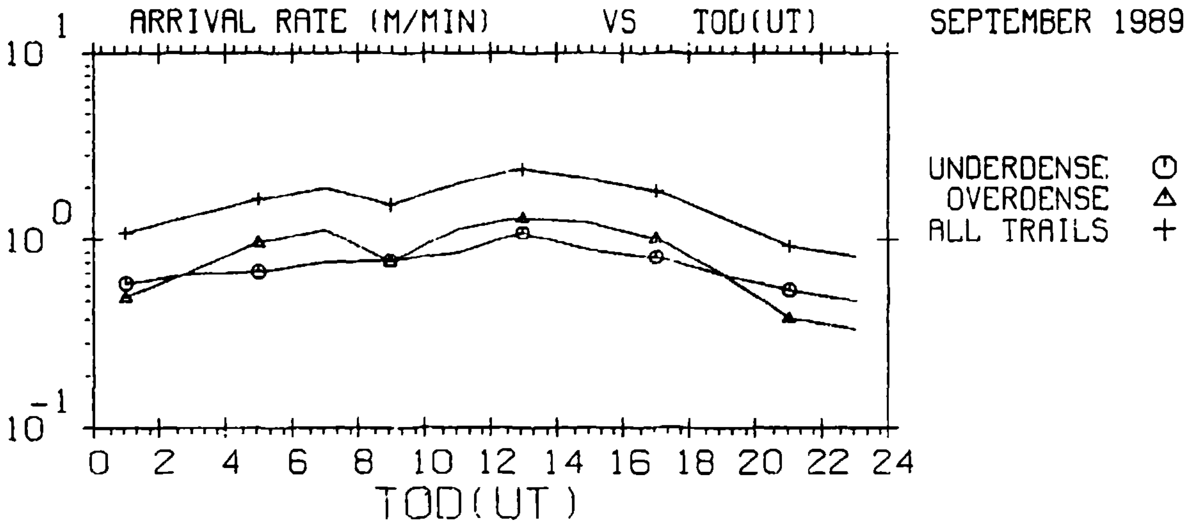
MENU#101,05-2
14-JUN-93
PLOT# 12.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

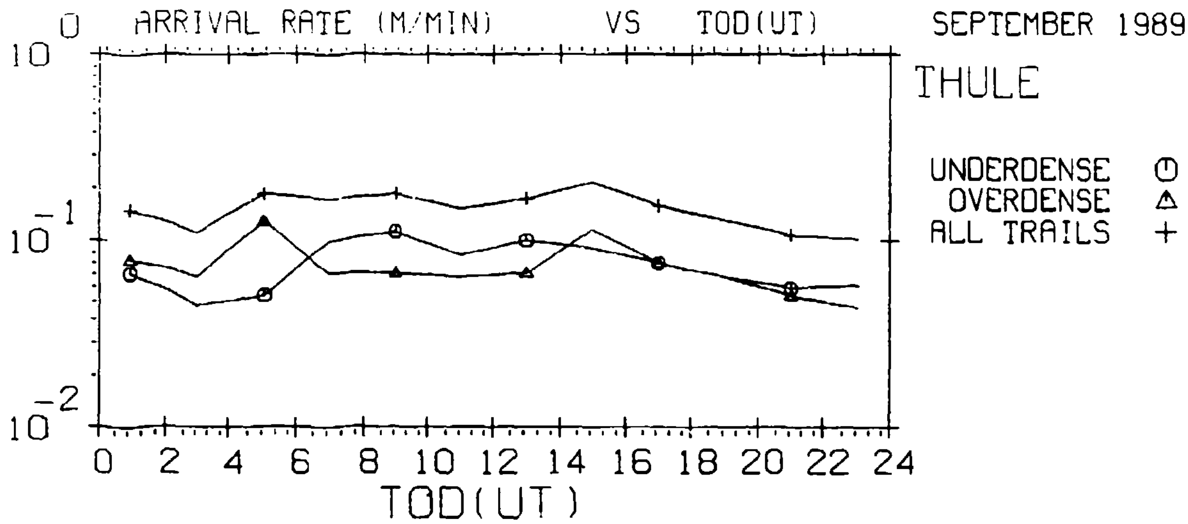
MENU*101,05-2
14-JUN-93
PLOT* 13.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

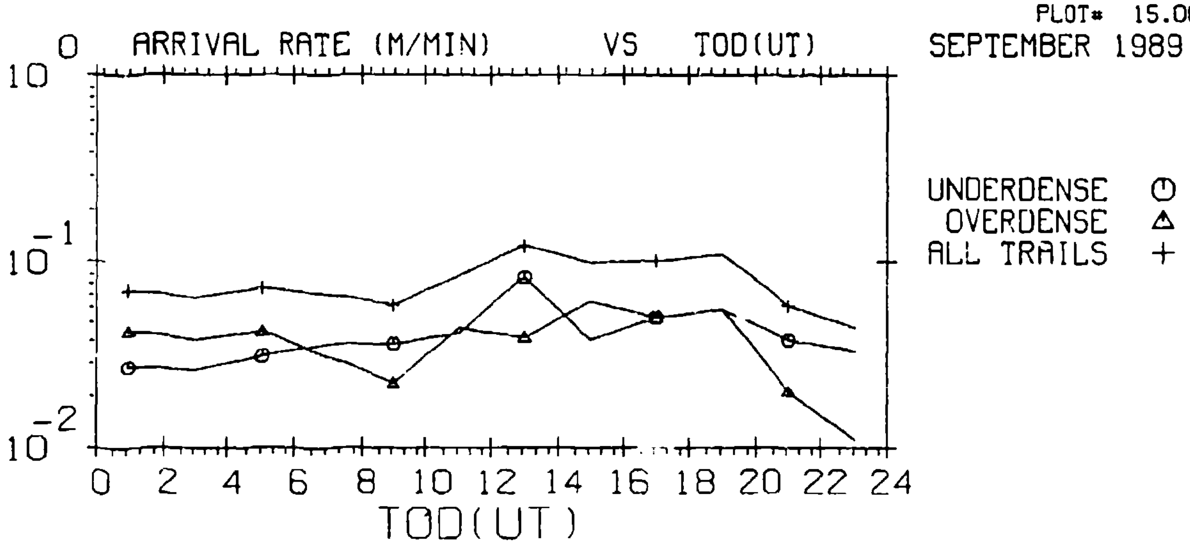
MENU*101,05-2
14-JUN-93
PLOT* 14.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

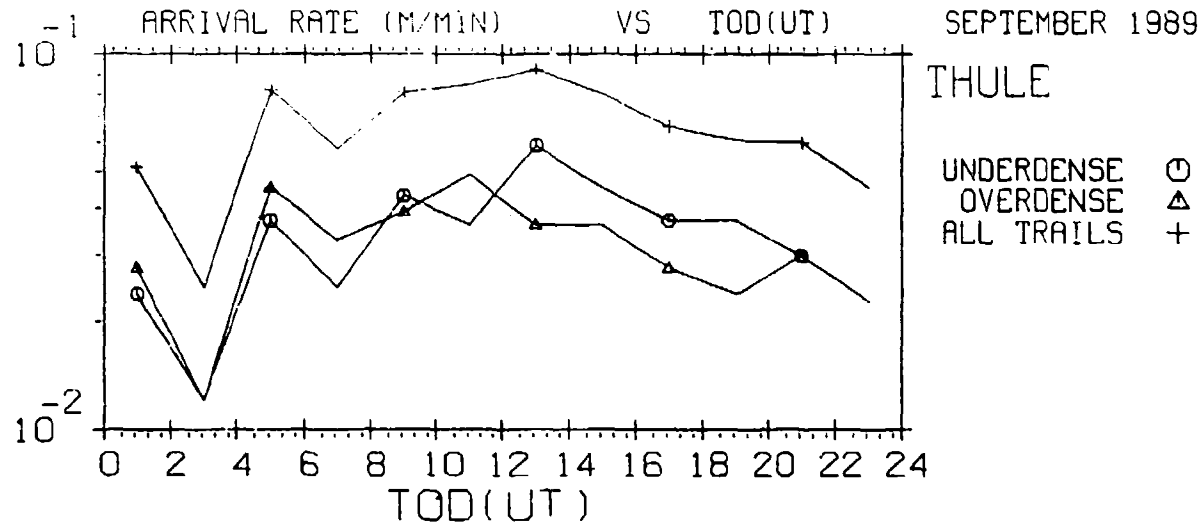
MENU=101,05-2
14-JUN-93
PLOT= 15.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

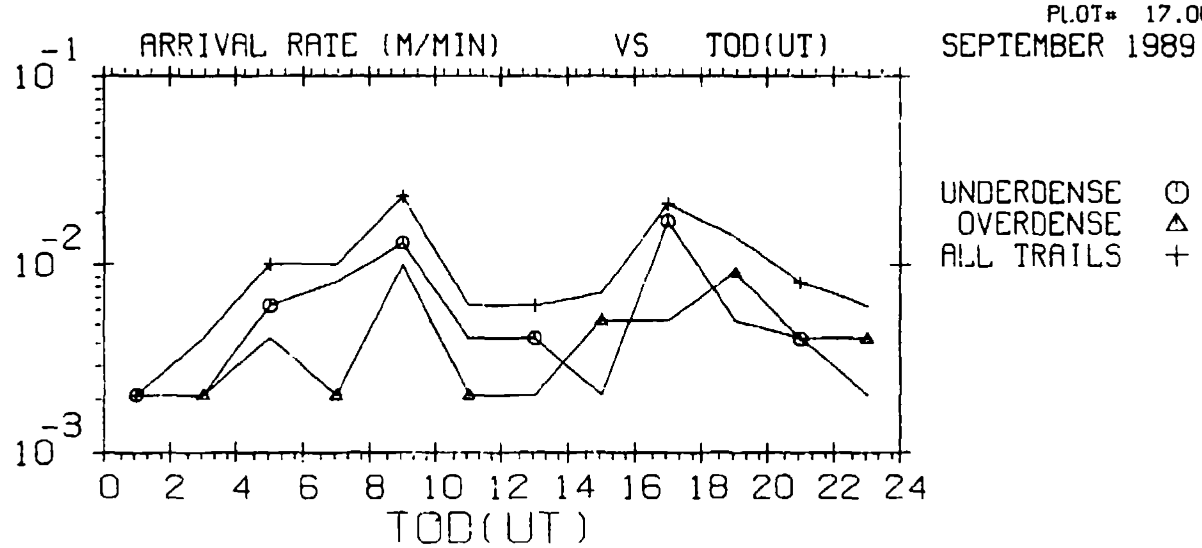
MENU=101,05-2
14-JUN-93
PLOT= 16.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

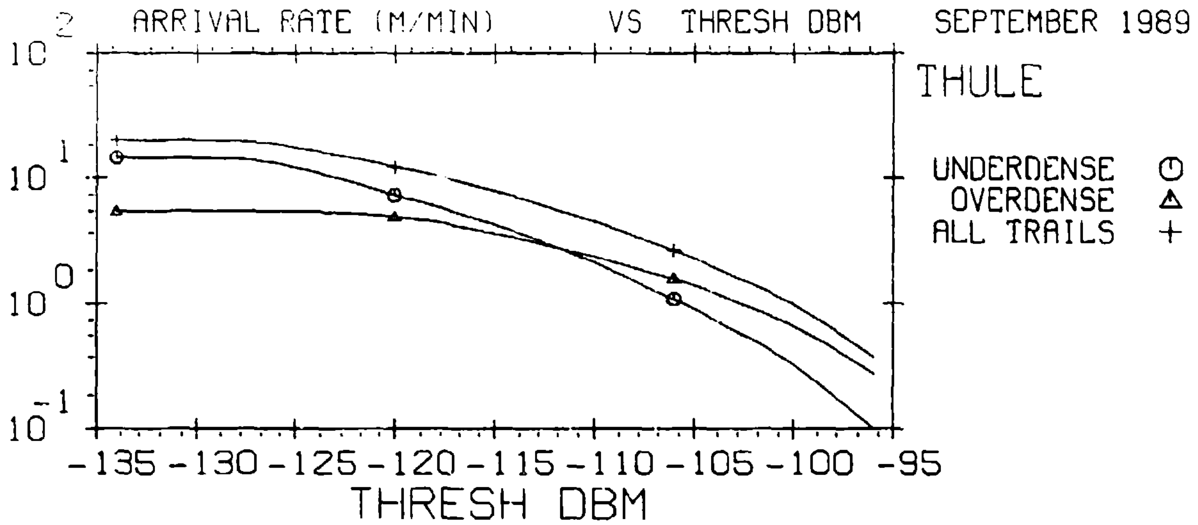
MENU*101,05-2
14-JUN-93
PLOT* 17.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

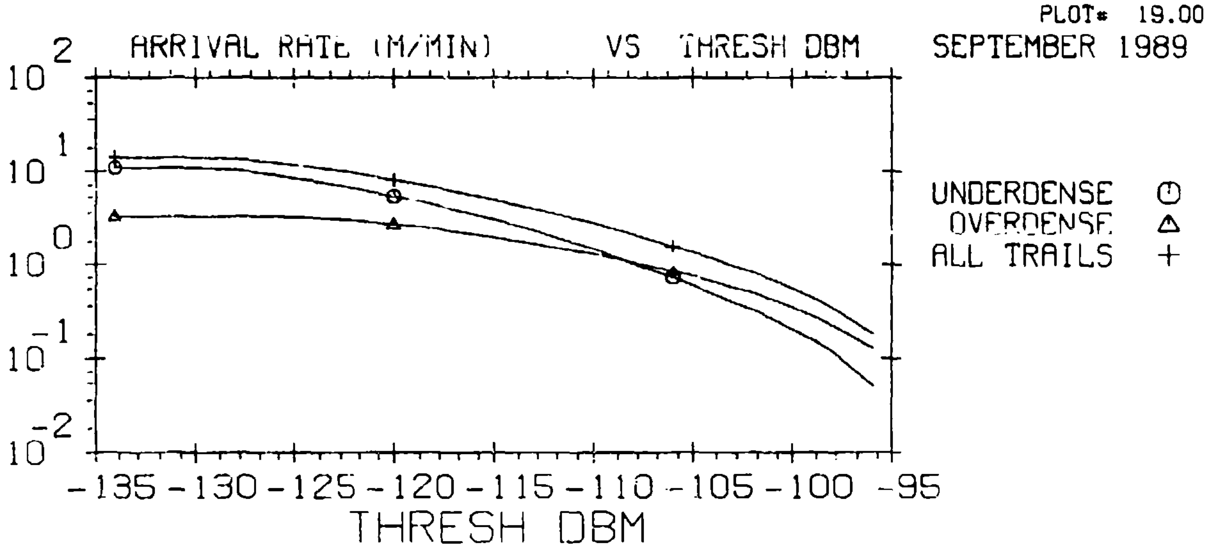
MENU*101,05-2
14-JUN-93
PLOT* 18.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

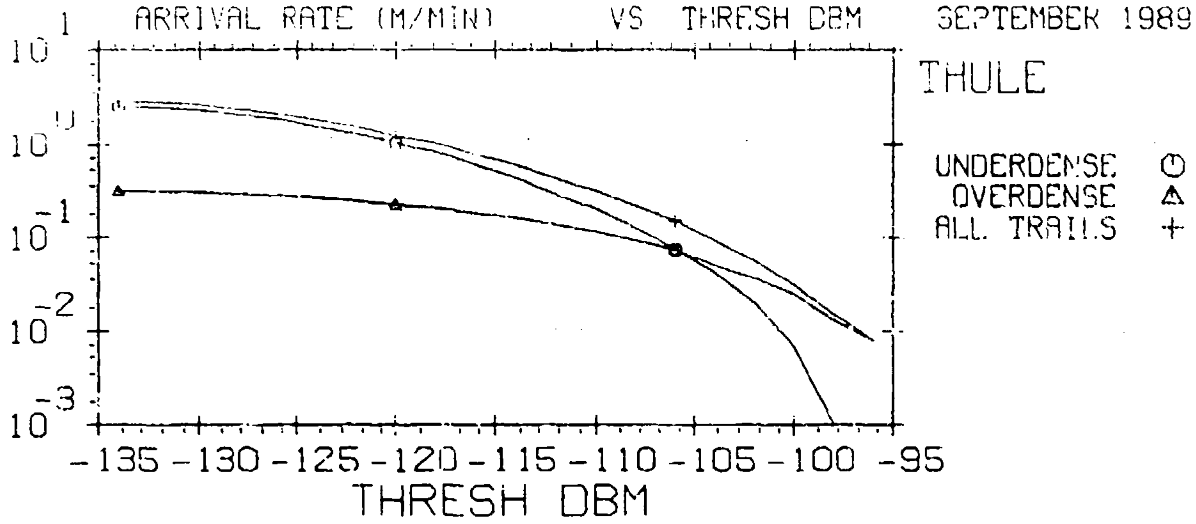
MENU# 101 ,06-2
14-JUN-93
PLOT# 19.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

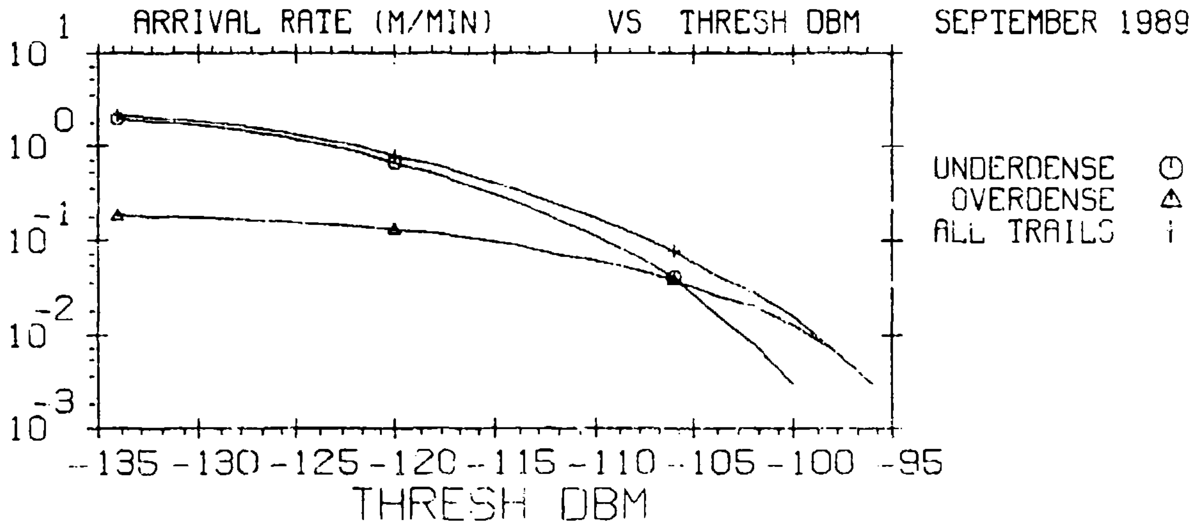
MENU 101,06-2
14-JUN-93
PLOT# 20.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

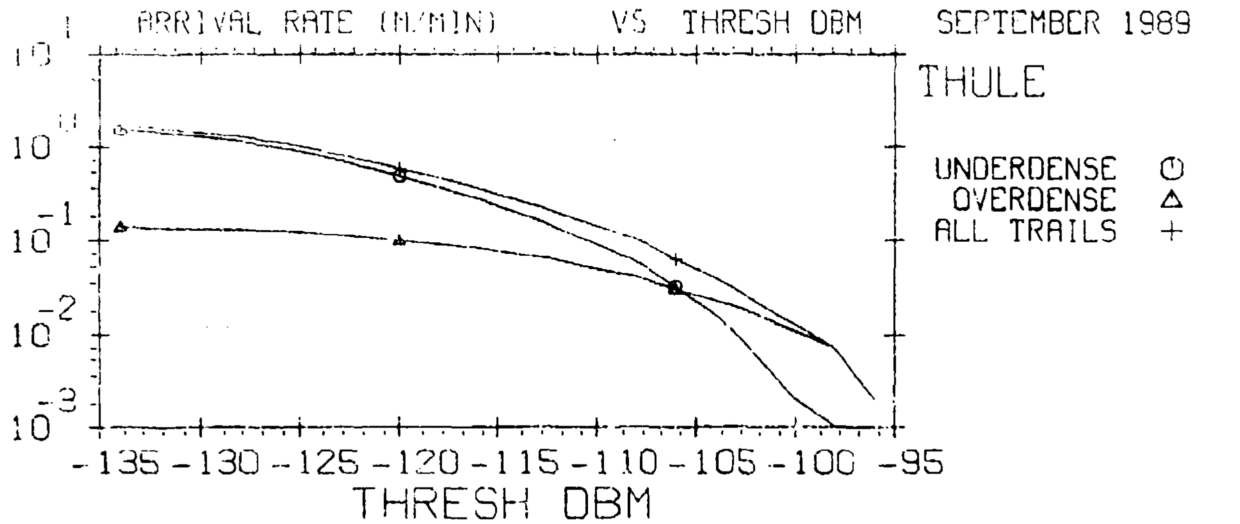
MENU#101,06-2
14-JUN-93
PLOT# 21.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

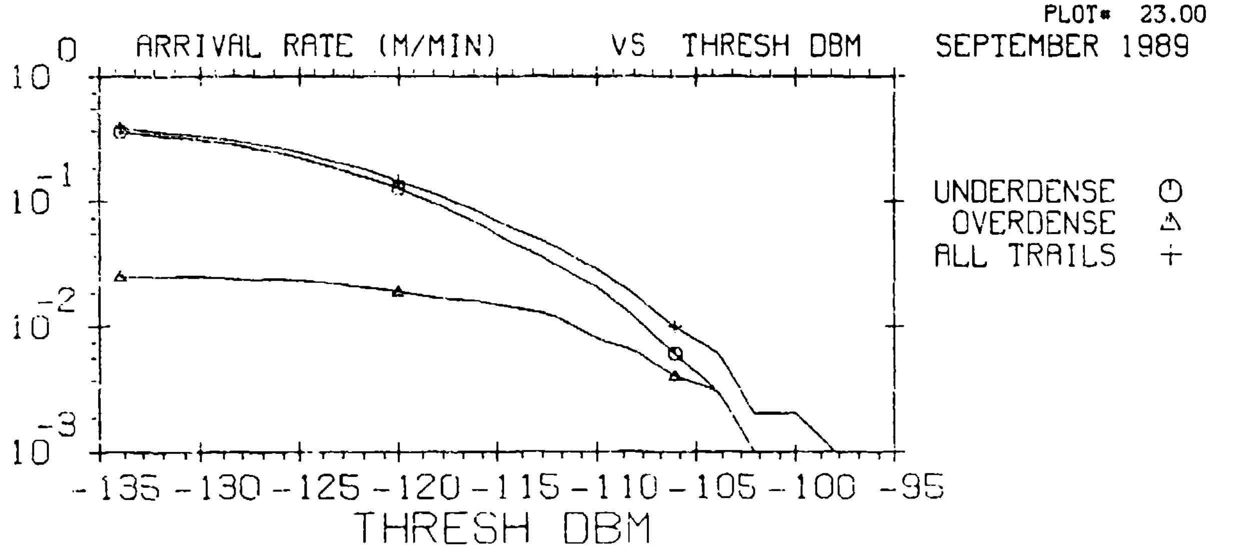
MENU#101,06-2
14-JUN-93
PLOT# 22.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

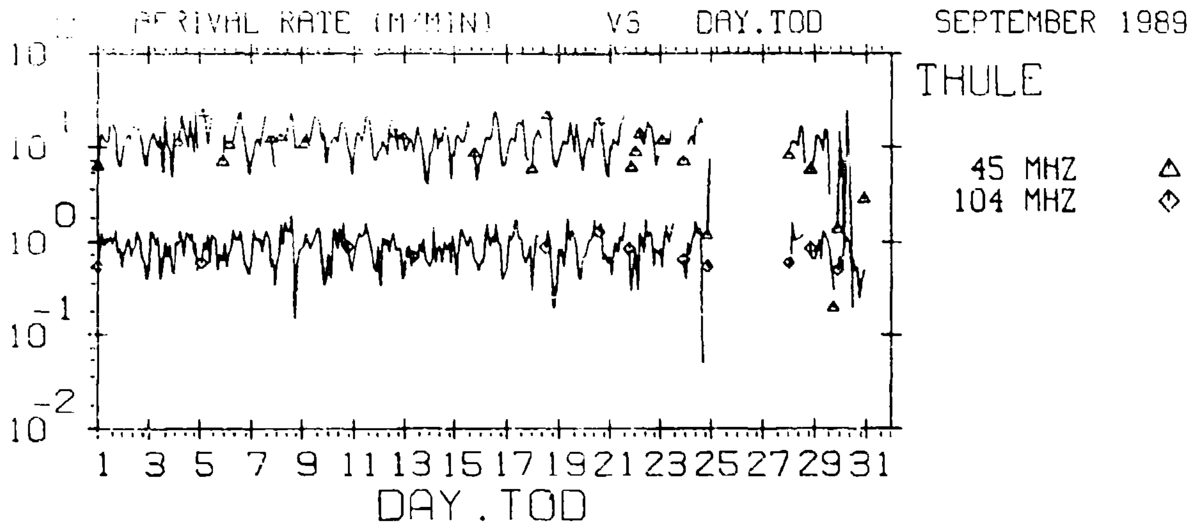
MENU#101,06-2
14-JUN-93
PLOT# 23.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

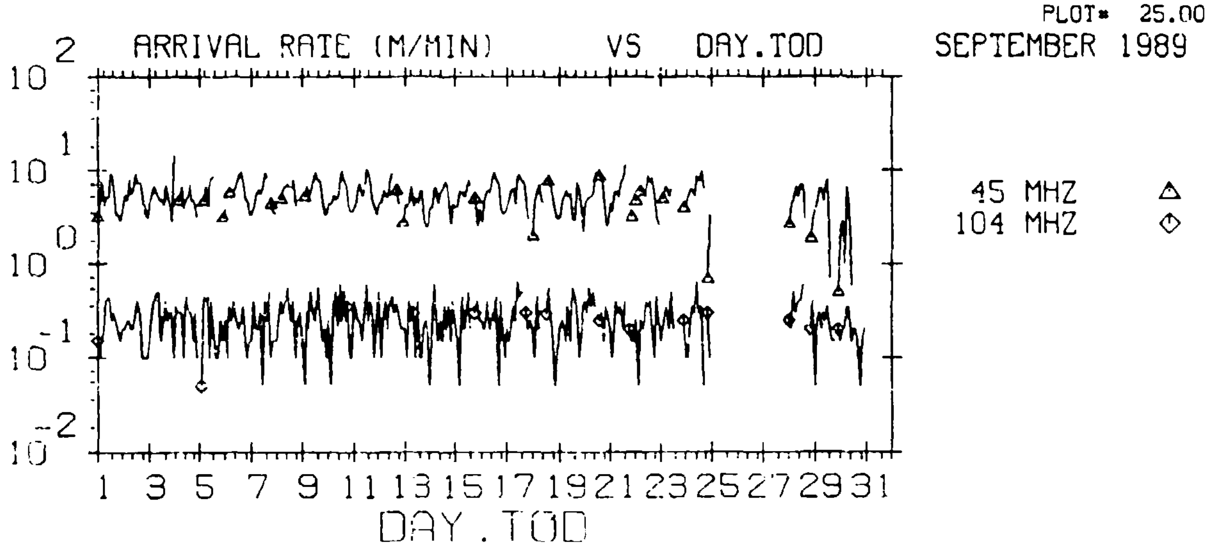
MENU#101,06-2
14-JUN-93
PLOT# 24.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

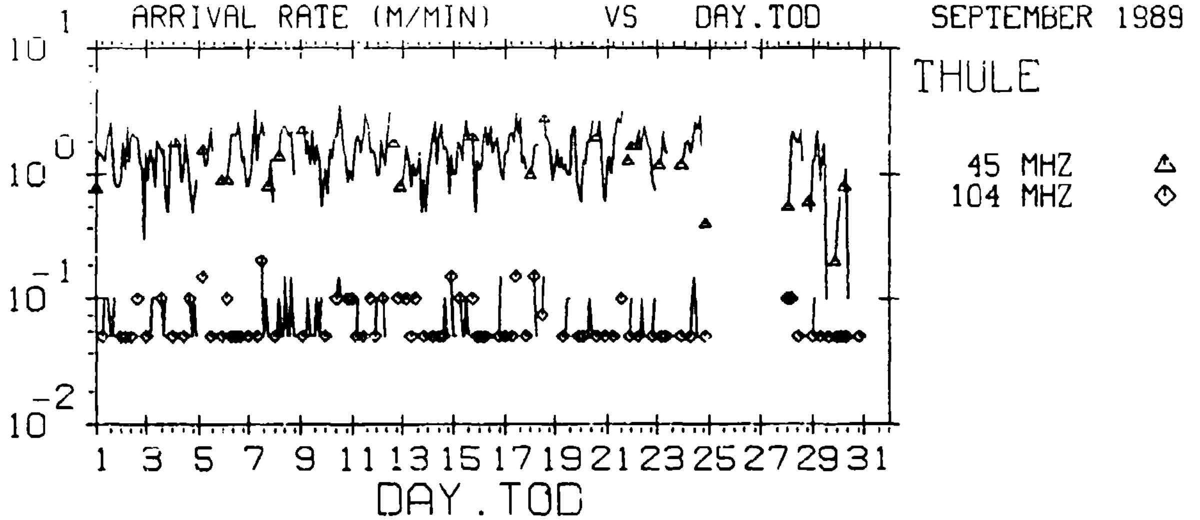
MENU=101,03-2
14-JUN-93
PLOT= 25.00




EXCEEDING -116.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

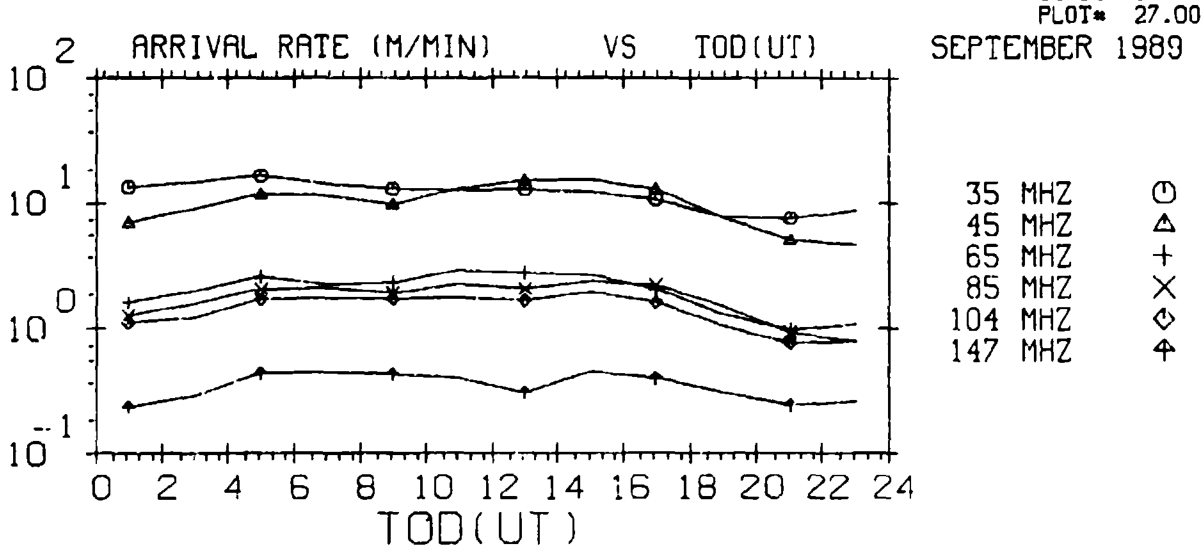
MENU=101,03-2
14-JUN-93
PLOT= 26.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SEL DS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

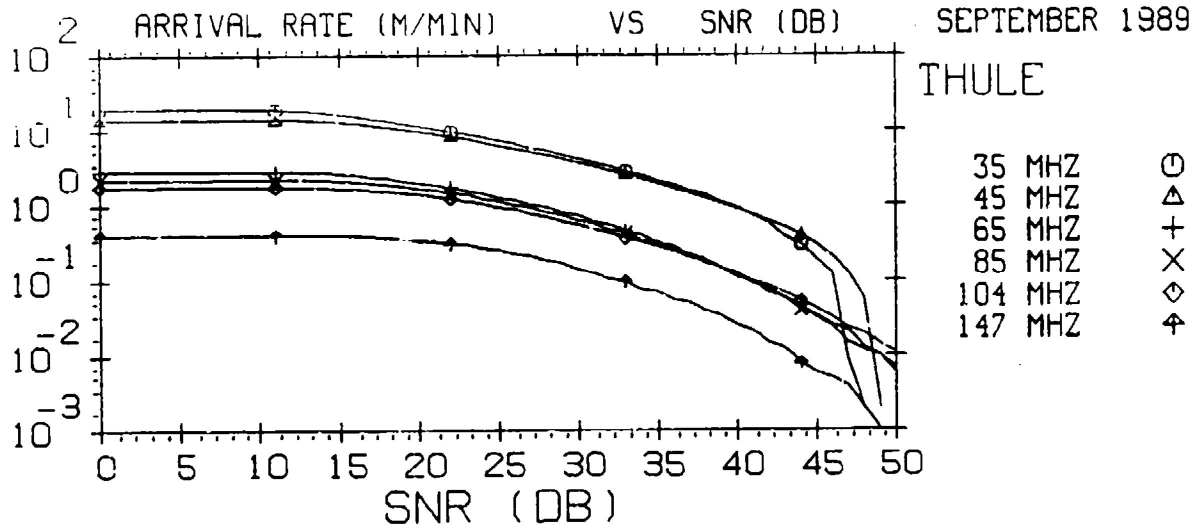
MENU*101,03-2
14-JUN-93
PLOT* 27.00




EXCEEDING 19.0 DB SNR
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

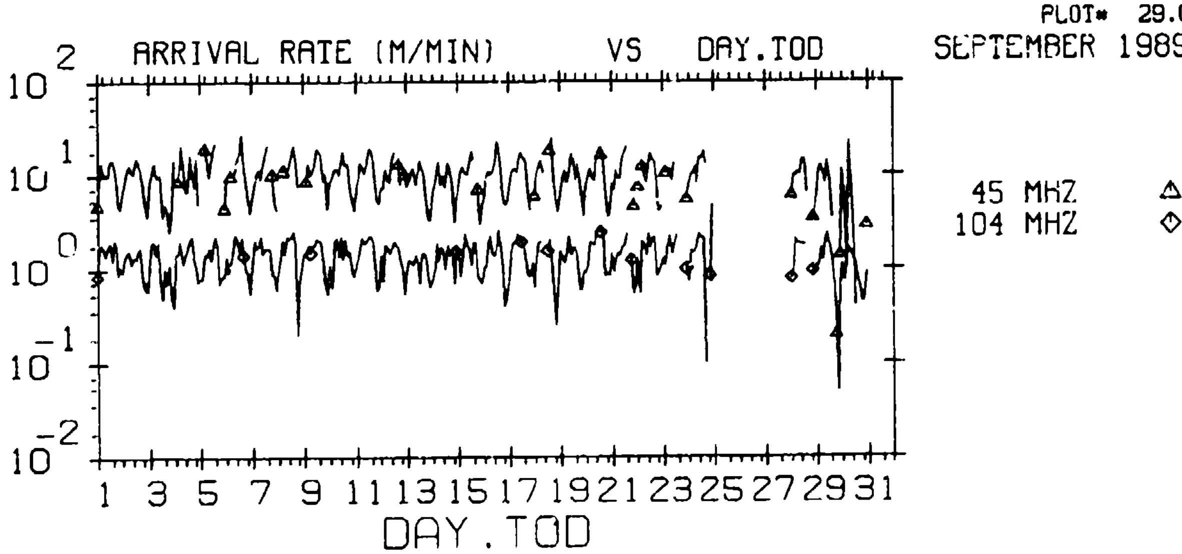
MENU*102,01-2
14-JUN-93
PLOT* 28.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

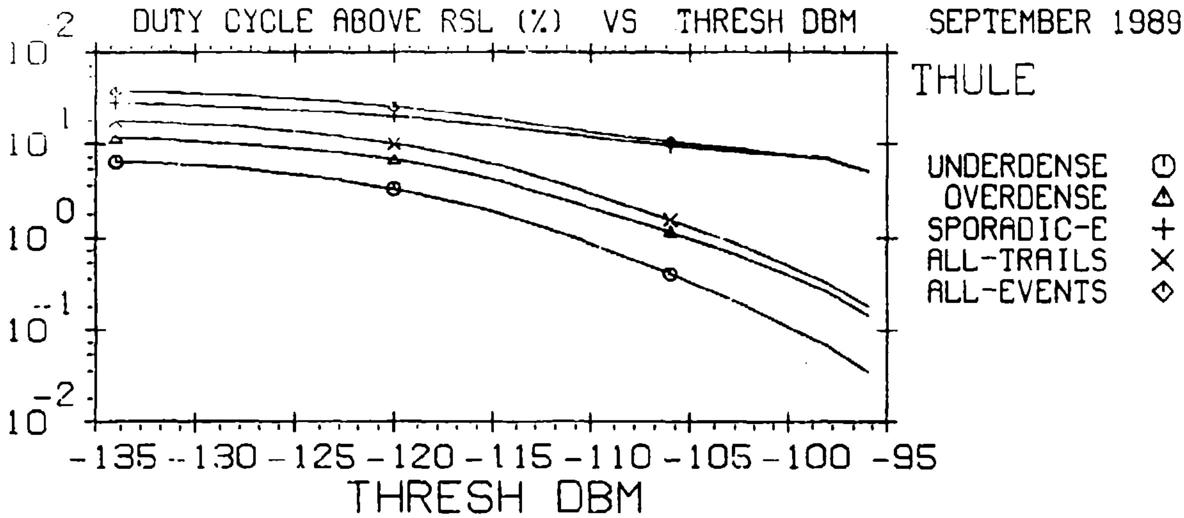
MENU#102,02-2
14-JUN-93
PLOT# 29.00




EXCEEDING 19.0 DB SNR
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

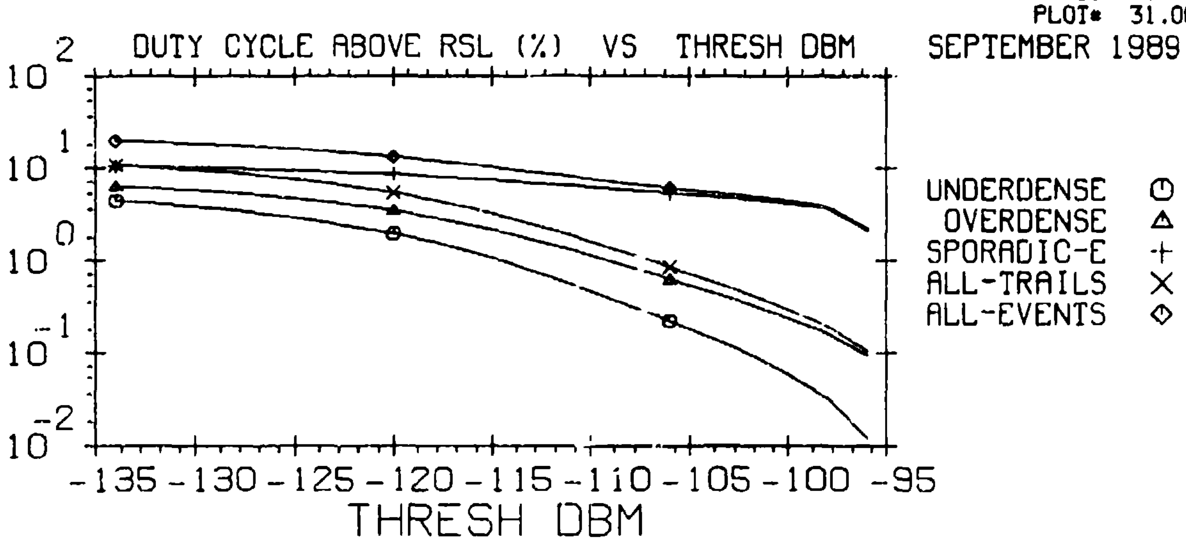
MENU#102,03-2
14-JUN-93
PLOT# 30.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

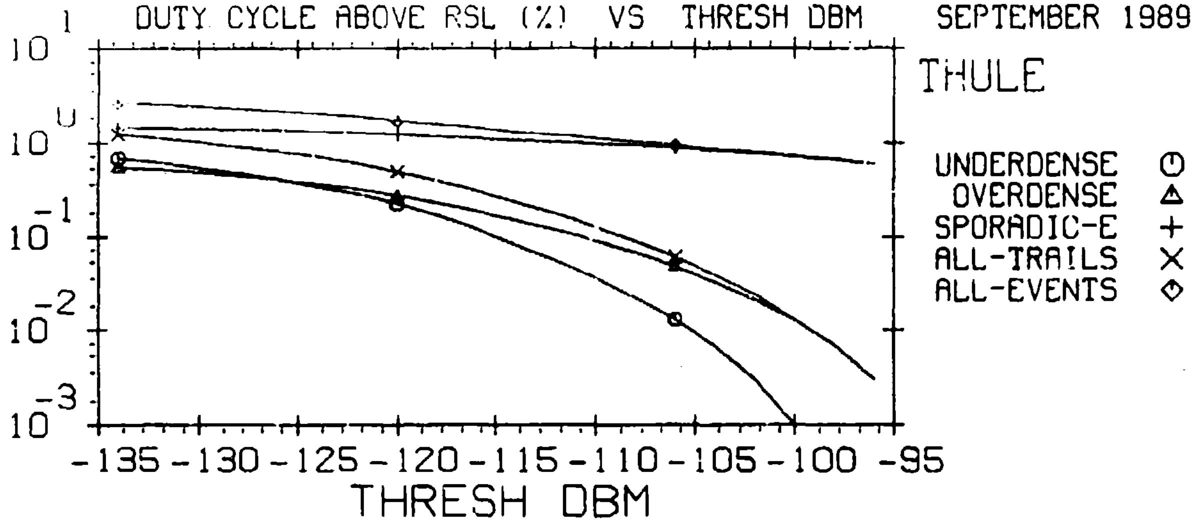
MENU*103,06-2
14-JUN-93
PLOT* 31.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

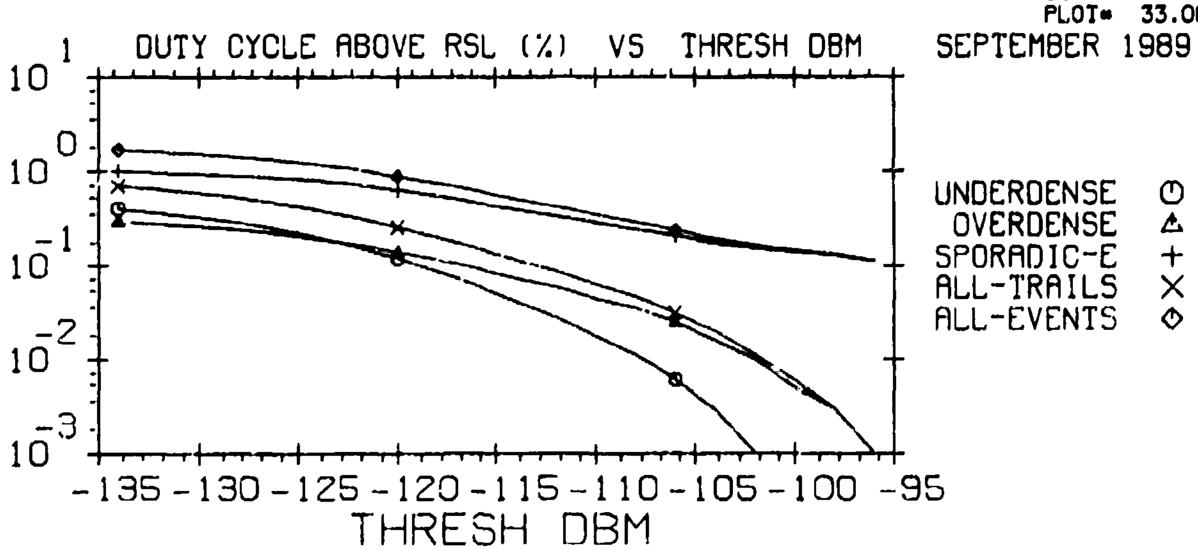
MENU*103,06-2
14-JUN-93
PLOT* 32.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

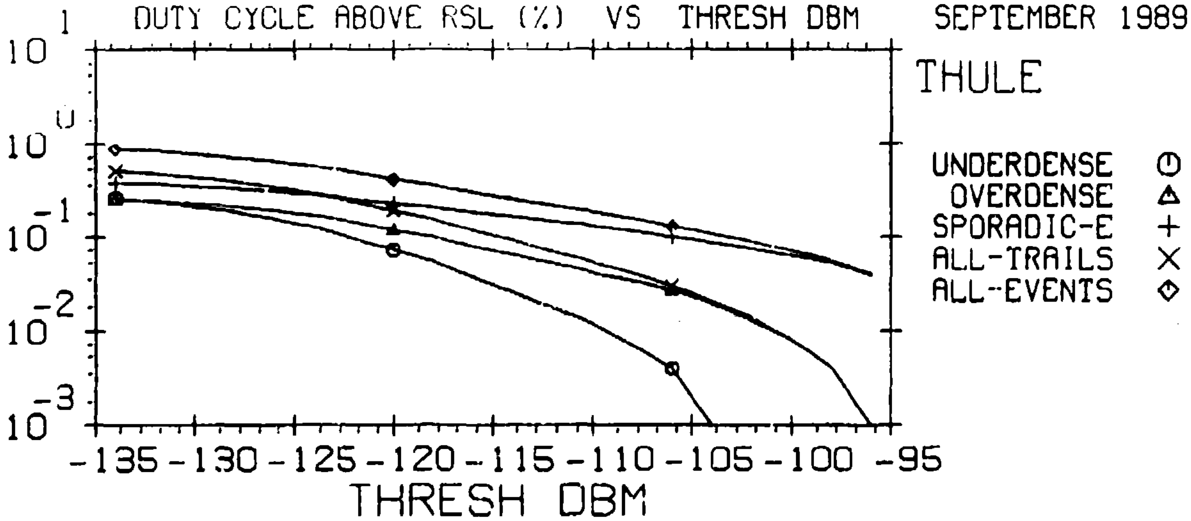
MENU* 103,06-2
14-JUN-93
PLOT* 33.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

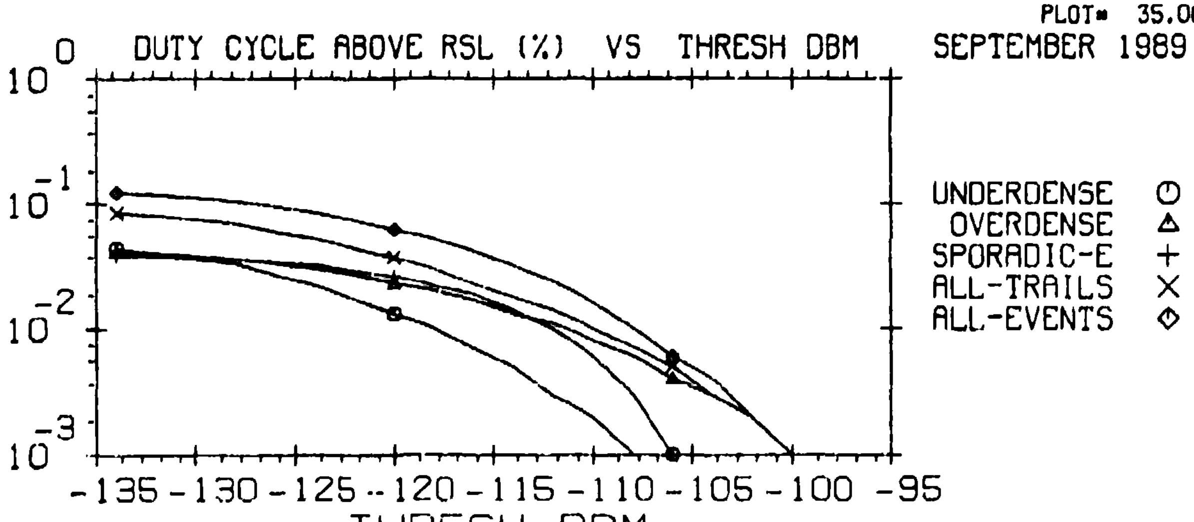
MENU* 103,06-2
14-JUN-93
PLOT* 34.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

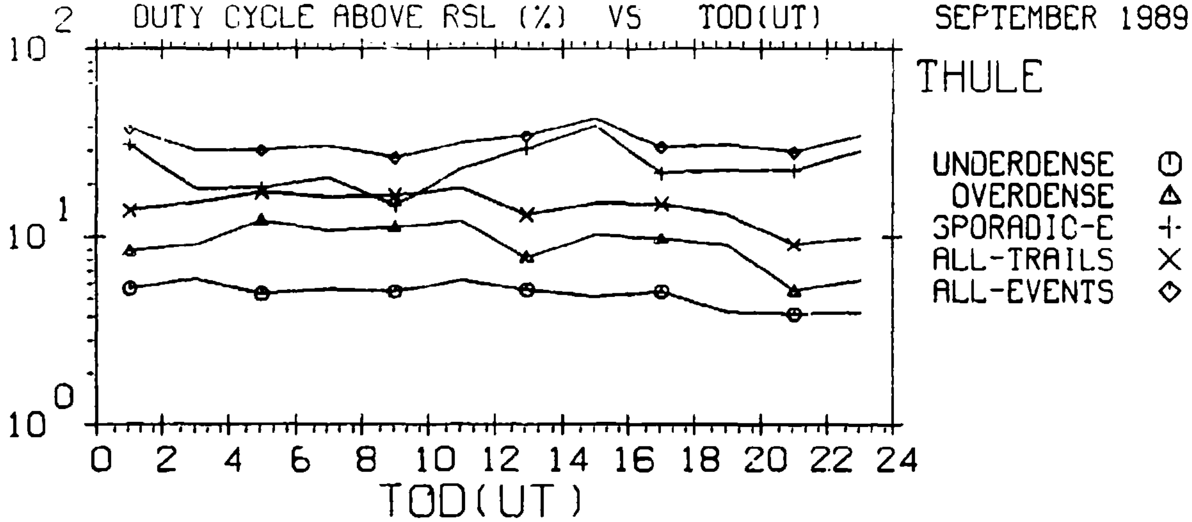
MENU=103,06-2
14-JUN-93
PLOT= 35.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

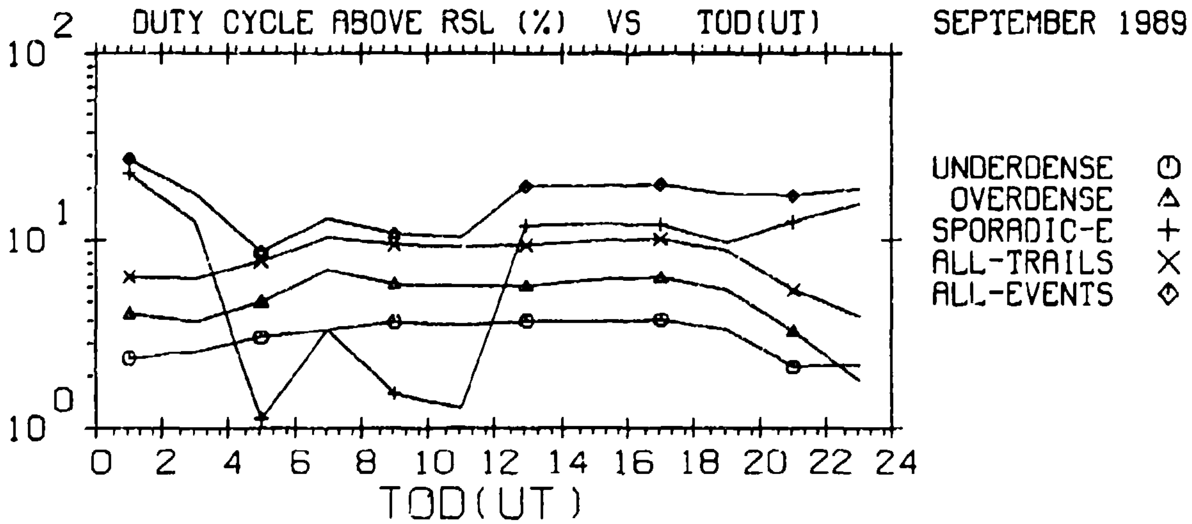
MENU=103,06-2
14-JUN-93
PLOT= 36.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

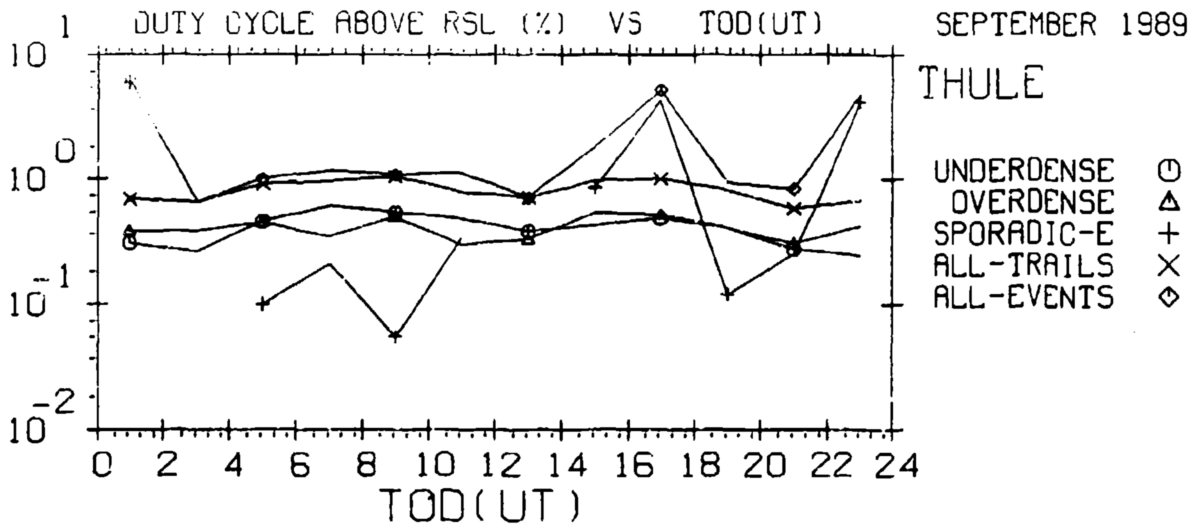
MENU*103,07-2
14-JUN-93
PLOT* 37.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

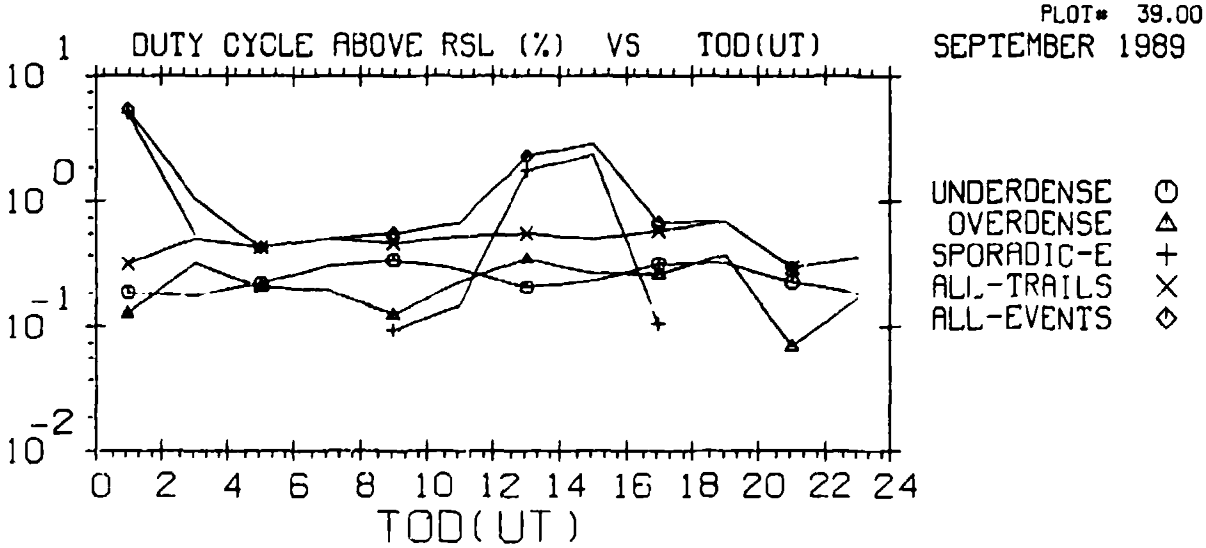
MENU*103,07-2
14-JUN-93
PLOT* 38.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

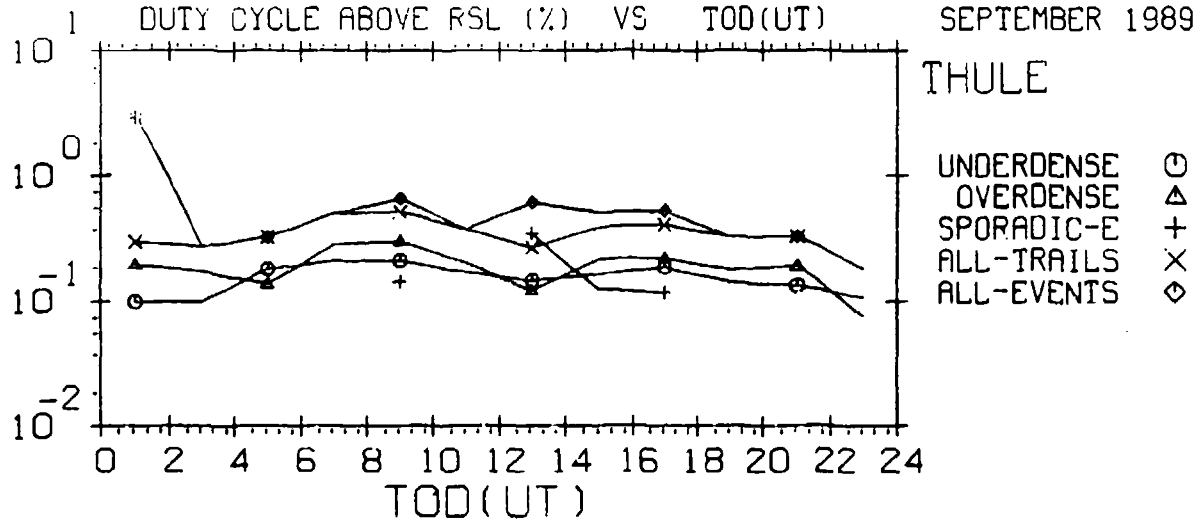
MENU# ..,0/-2
14-JUN-93
PLOT# 39.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

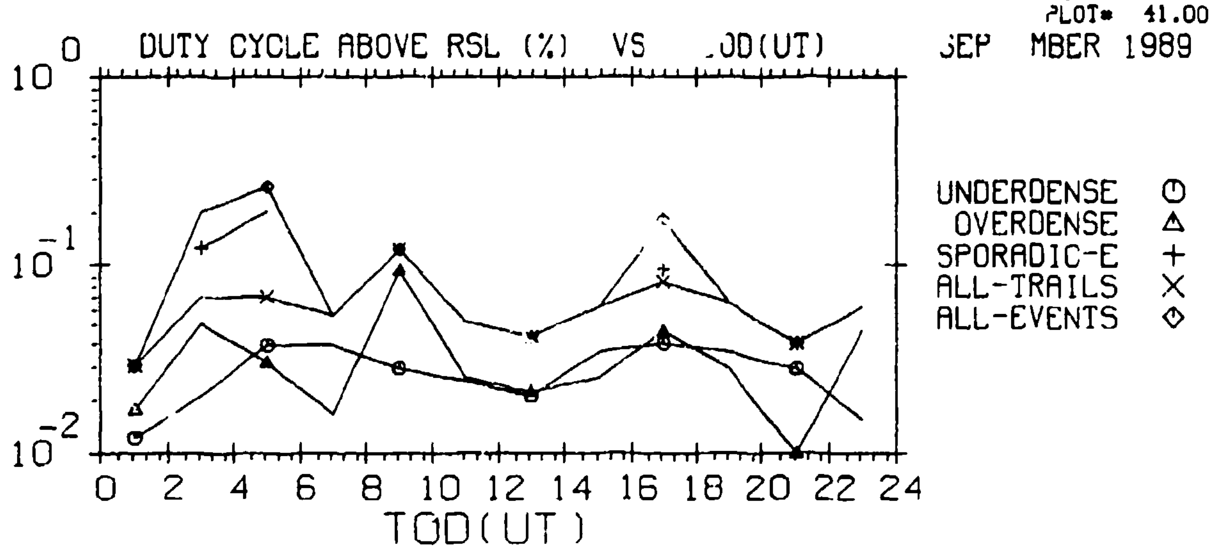
MENU#103,07-2
14-JUN-93
PLOT# 40.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

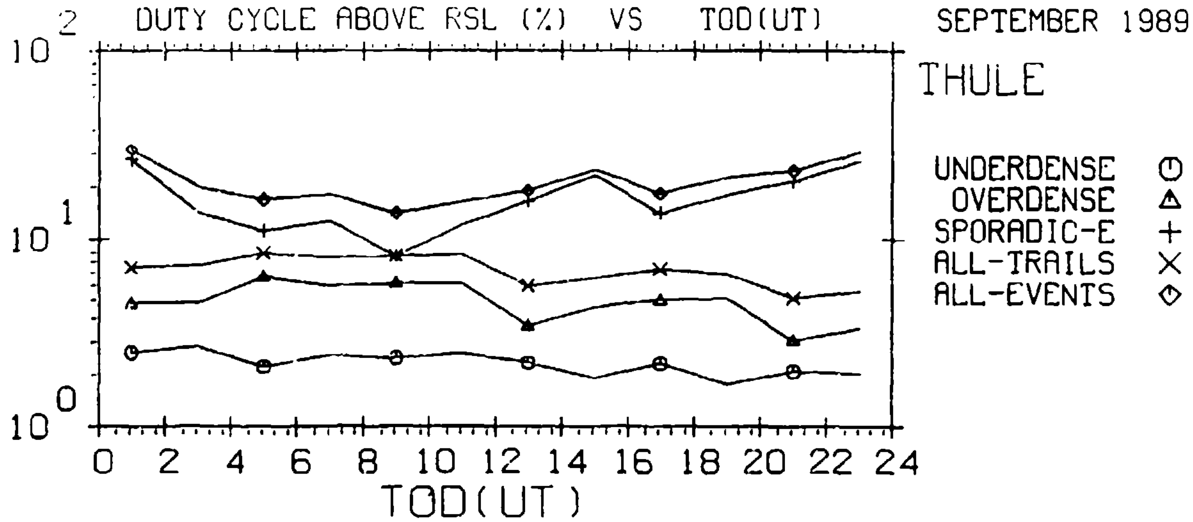
MENU*103,07-2
14-JUN-93
PLOT* 41.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

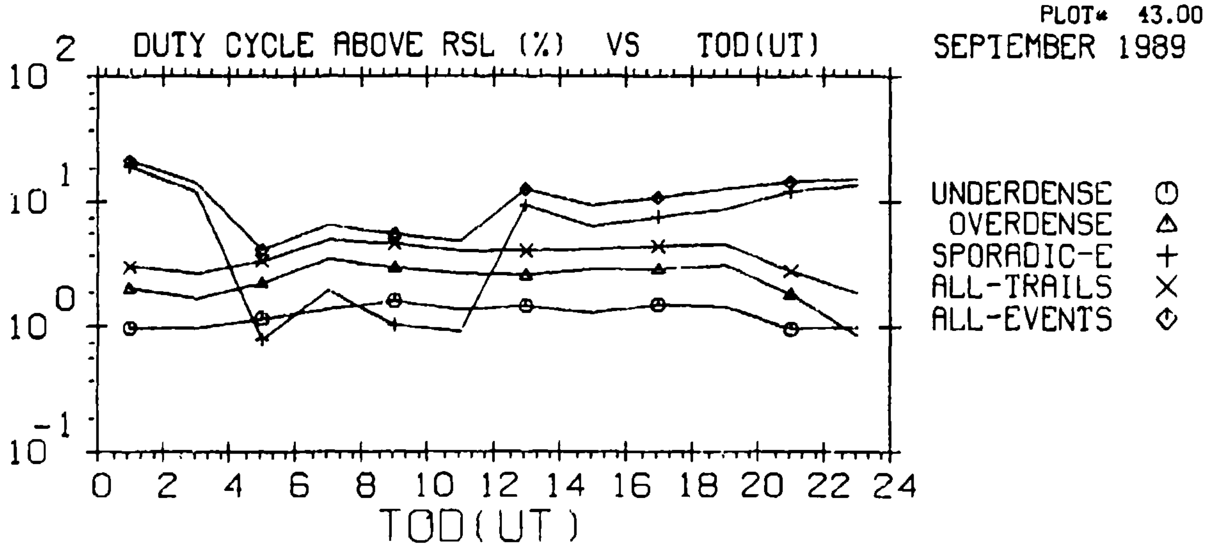
MENU*103,07-2
14-JUN-93
PLOT* 42.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

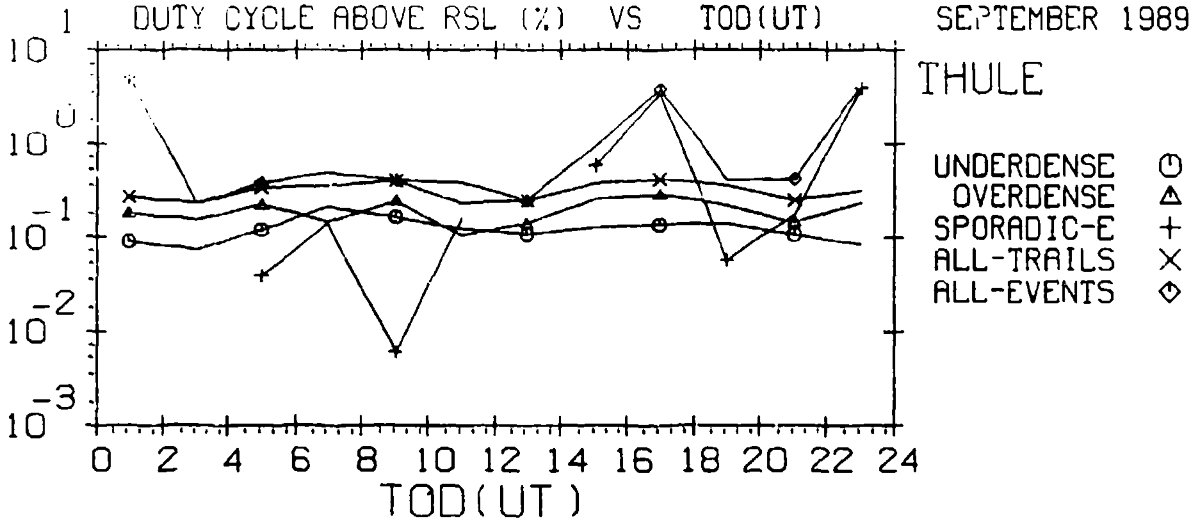
MENU* 103,07-2
14-JUN-93
PLOT* 43.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

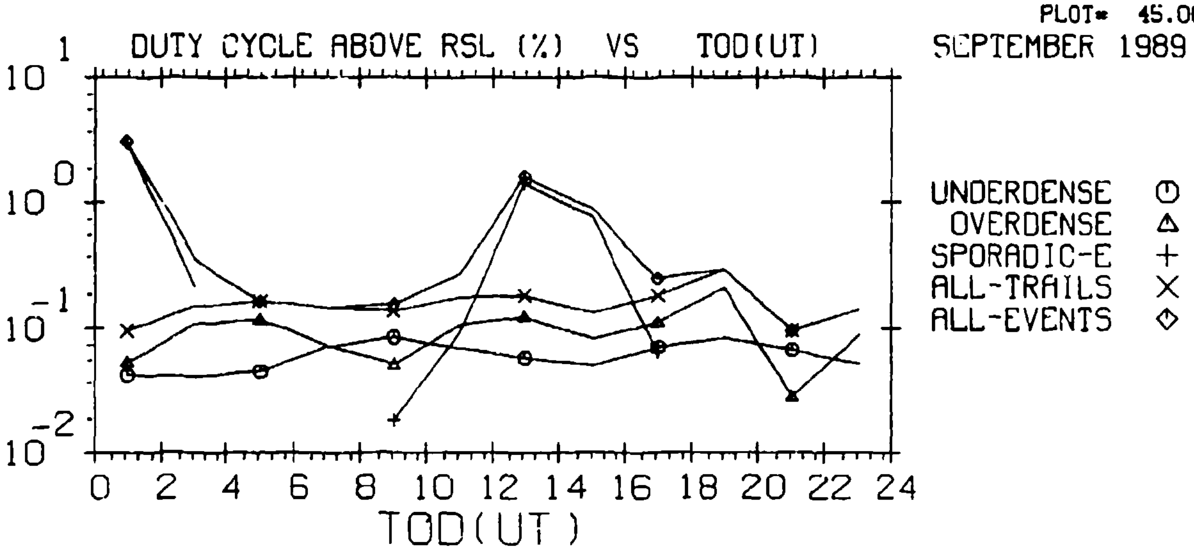
MENU* 103,07-2
14-JUN-93
PLOT* 44.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

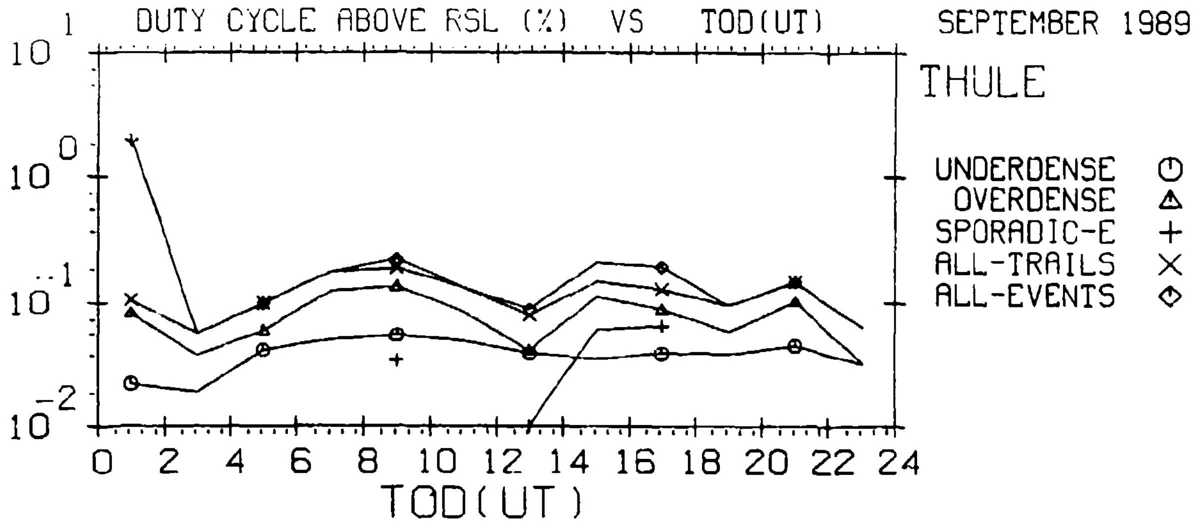
MENU*103,07-2
14-JUN-93
PLOT* 45.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

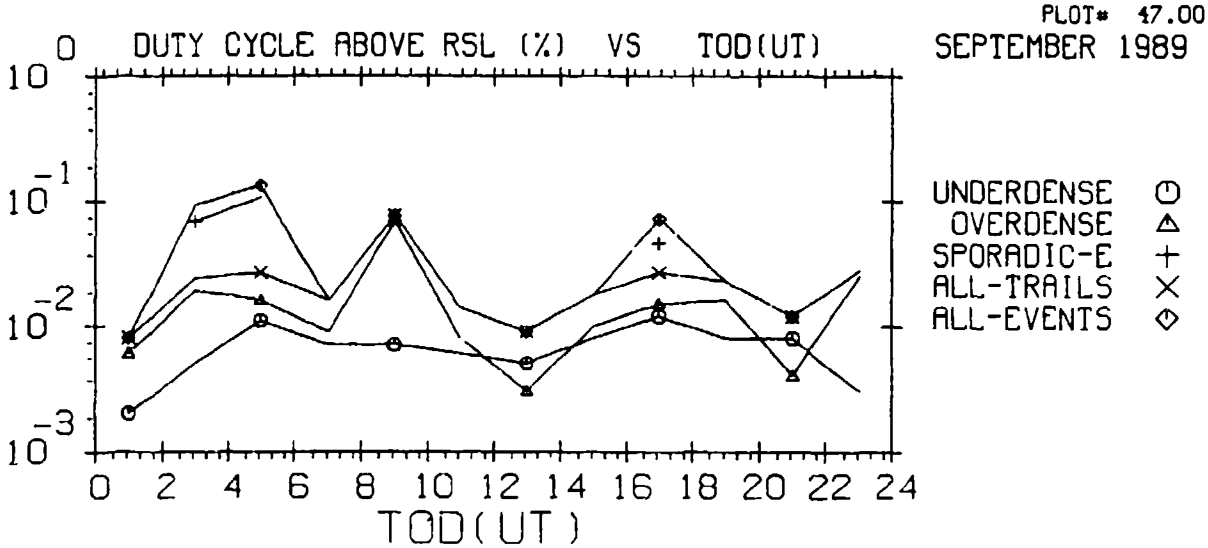
MENU*103,07-2
14-JUN-93
PLOT* 46.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

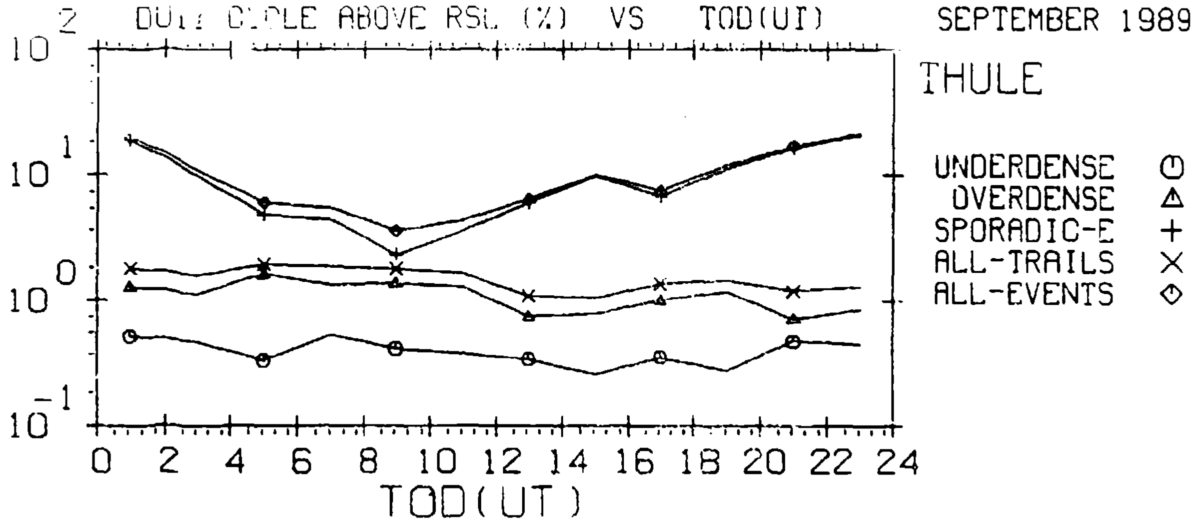
MENU*103,07-2
14-JUN-93
PLOT* 47.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

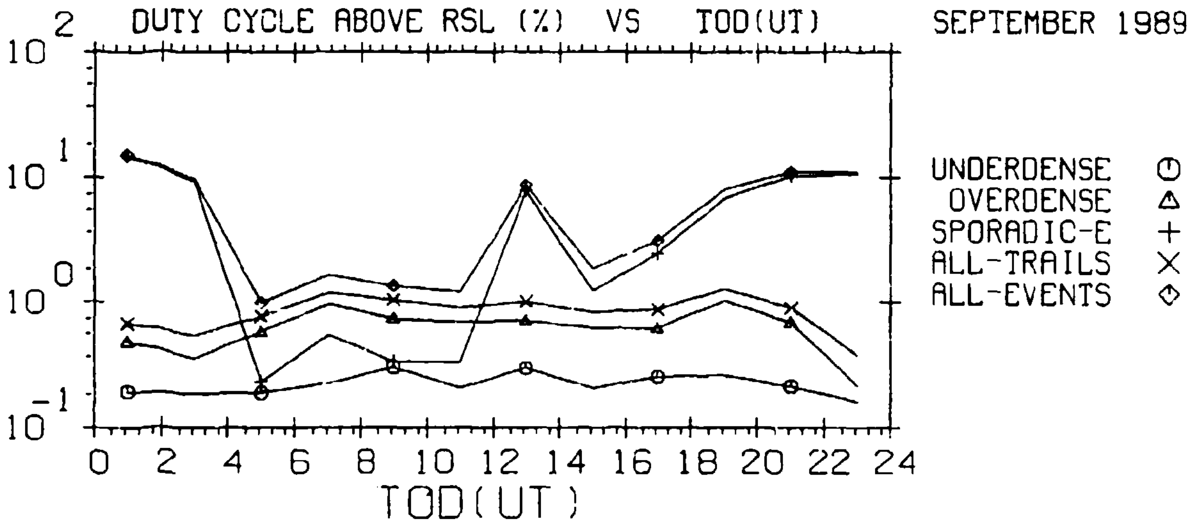
MENU*103,07-2
14-JUN-93
PLOT* 48.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

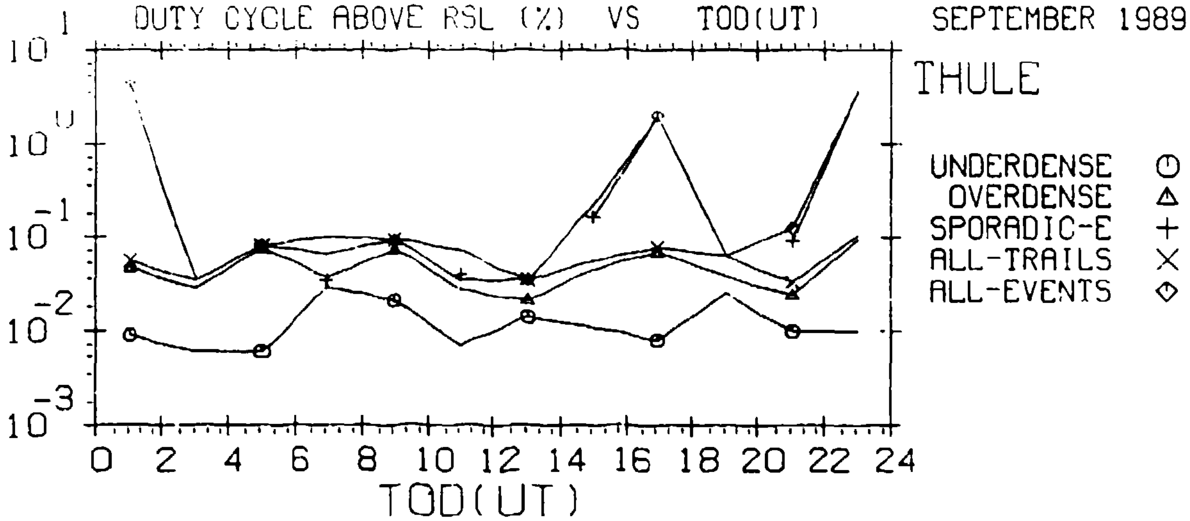
MENU*103,07-2
14-JUN-93
PLOT* 49.00




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

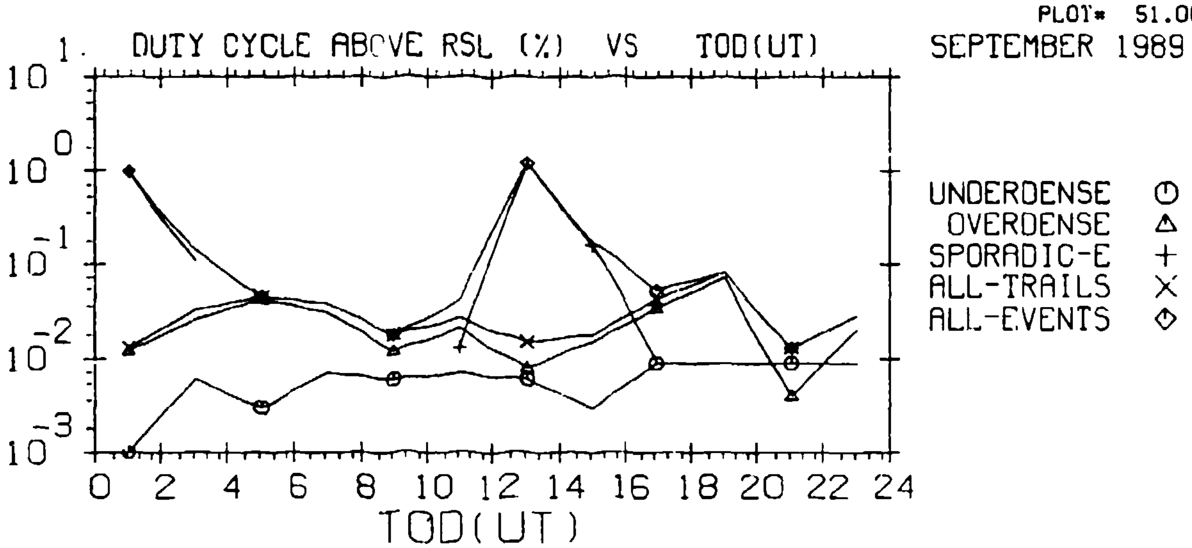
MENU*103,07-2
14-JUN-93
PLOT* 50.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

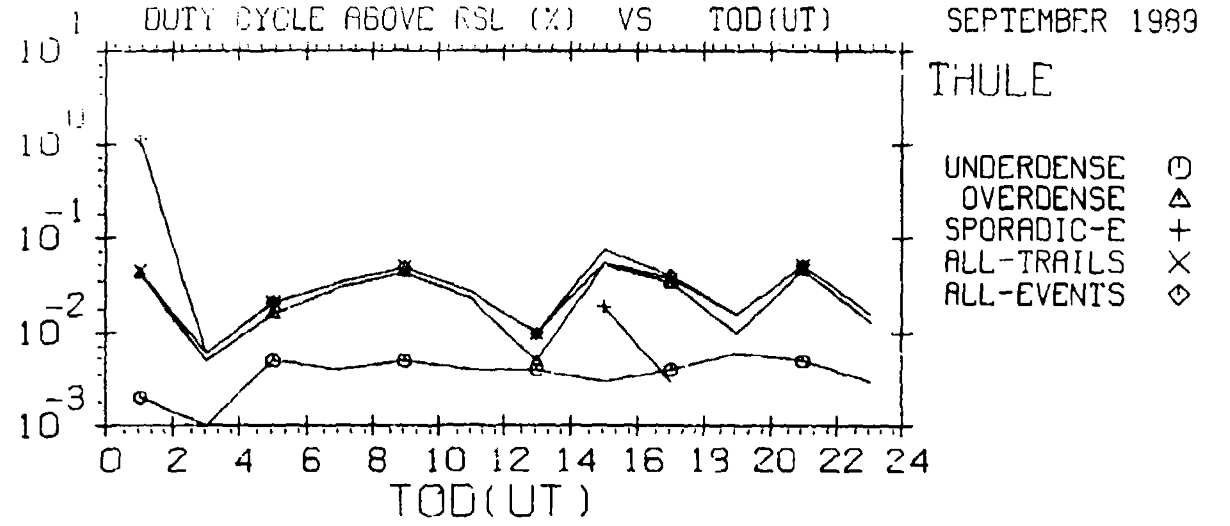
MENU* 103,07-2
14-JUN-93
PLOT* 51.00




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

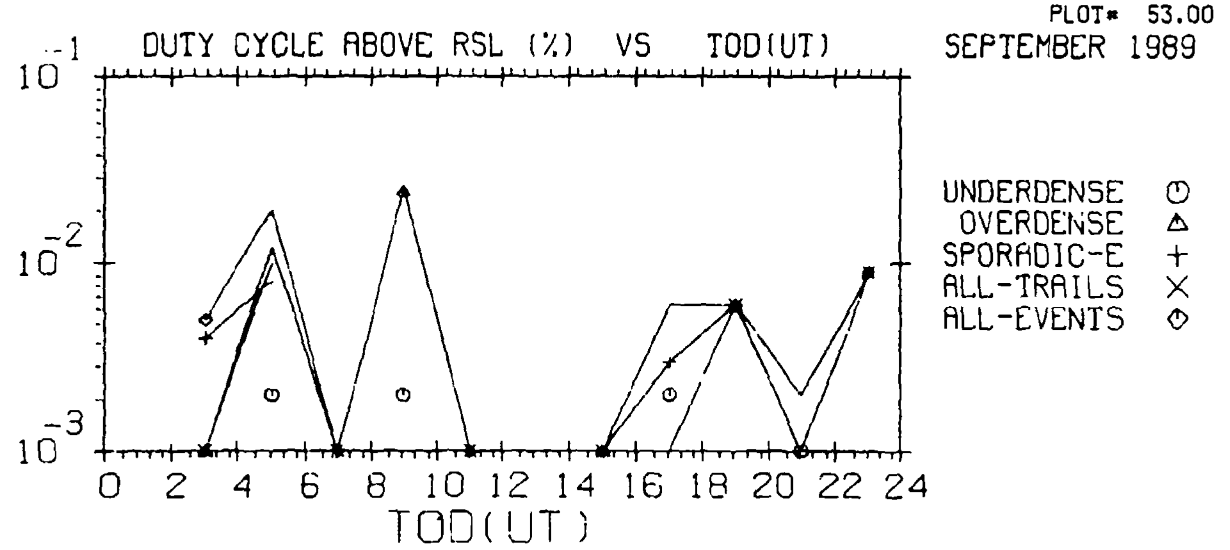
MENU* 103,07-2
14-JUN-93
PLOT* 52.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD = -106.0 DBM RSL
FREQUENCY = 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

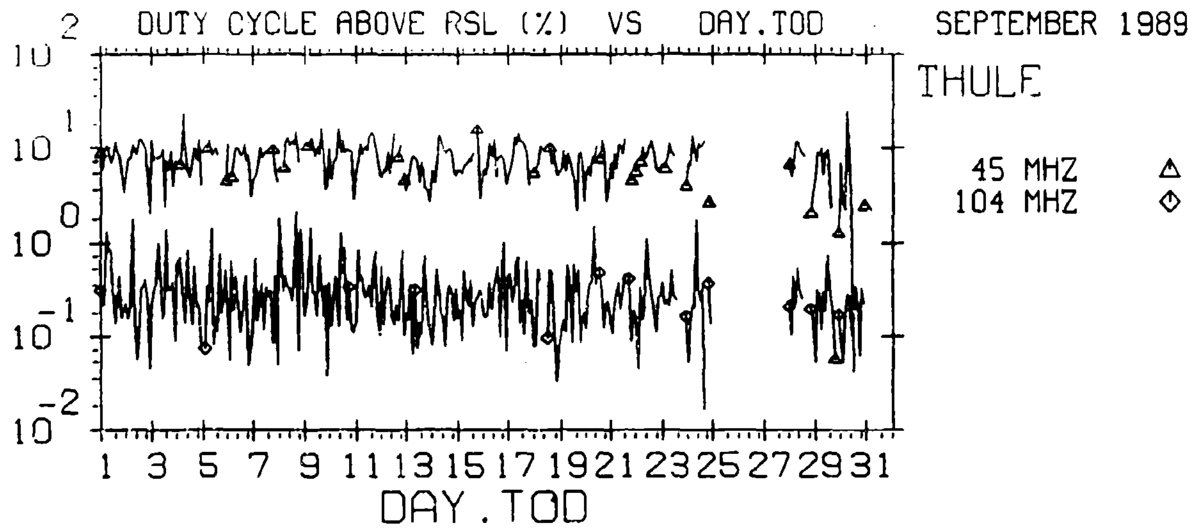
MENU*103,07-2
14-JUN-93
PLOT* 53.00




THRESHOLD = -106.0 DBM RSL
FREQUENCY = 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

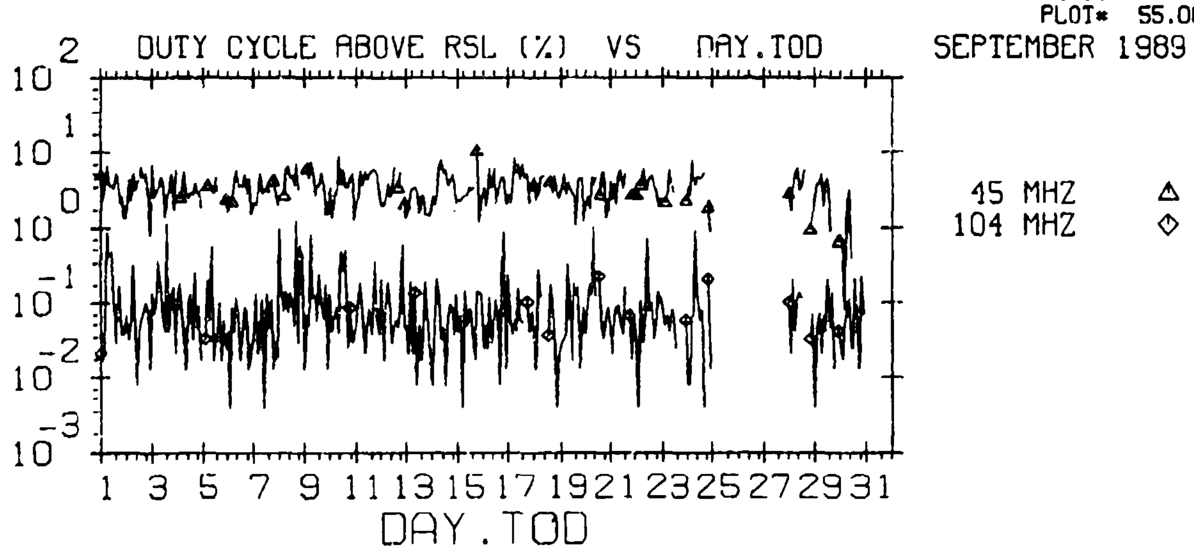
MENU*103,07-2
14-JUN-93
PLOT* 54.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

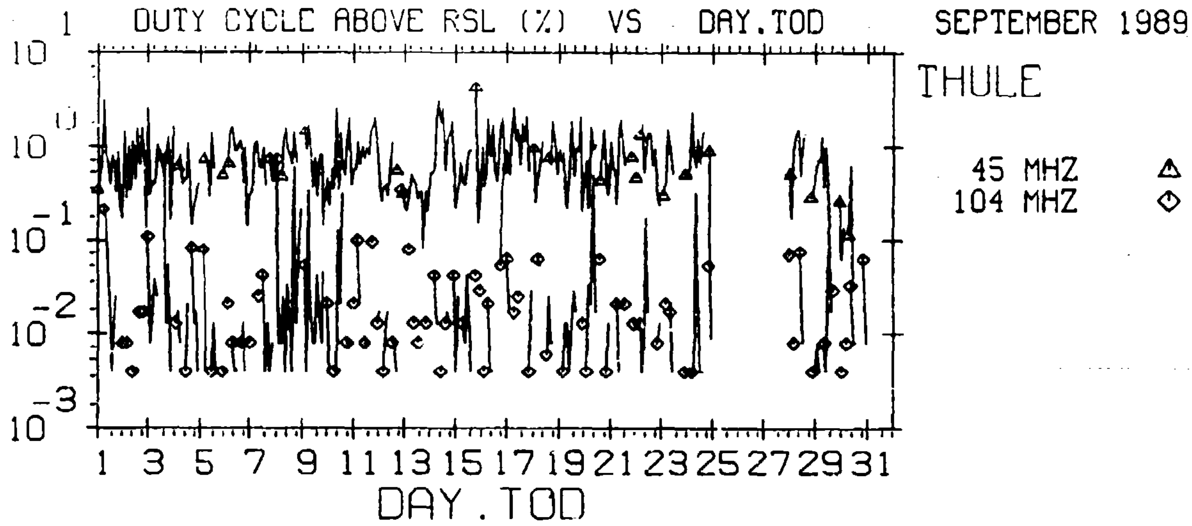
MENU*1 3,09-2
14-JUN 93
PLOT* 55.00




THRESHOLD - -116.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

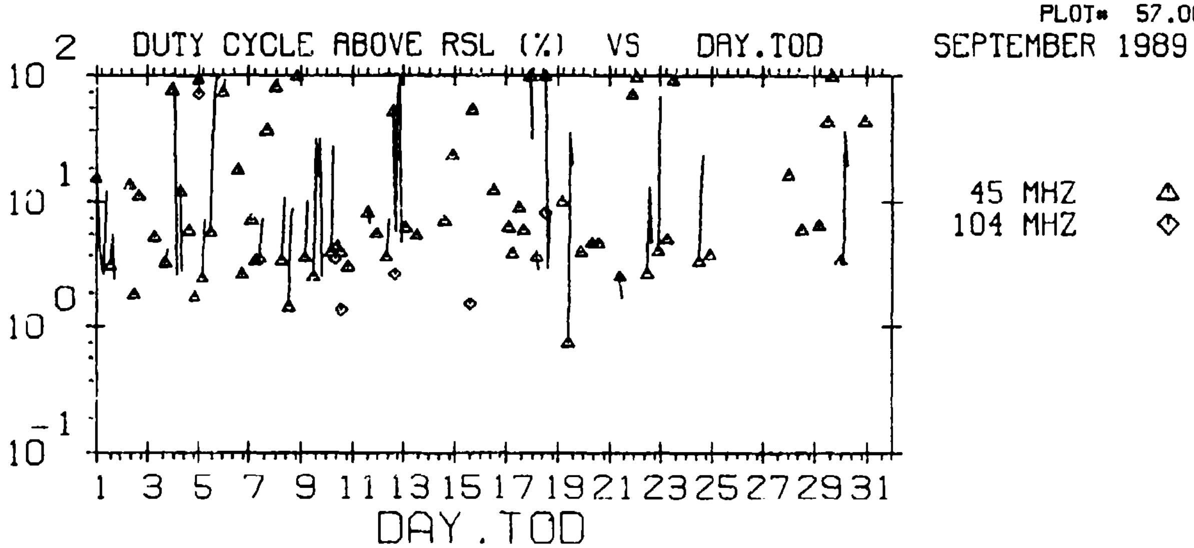
MENU*103,09-2
14-JUN-93
PLOT* 56.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - −106.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

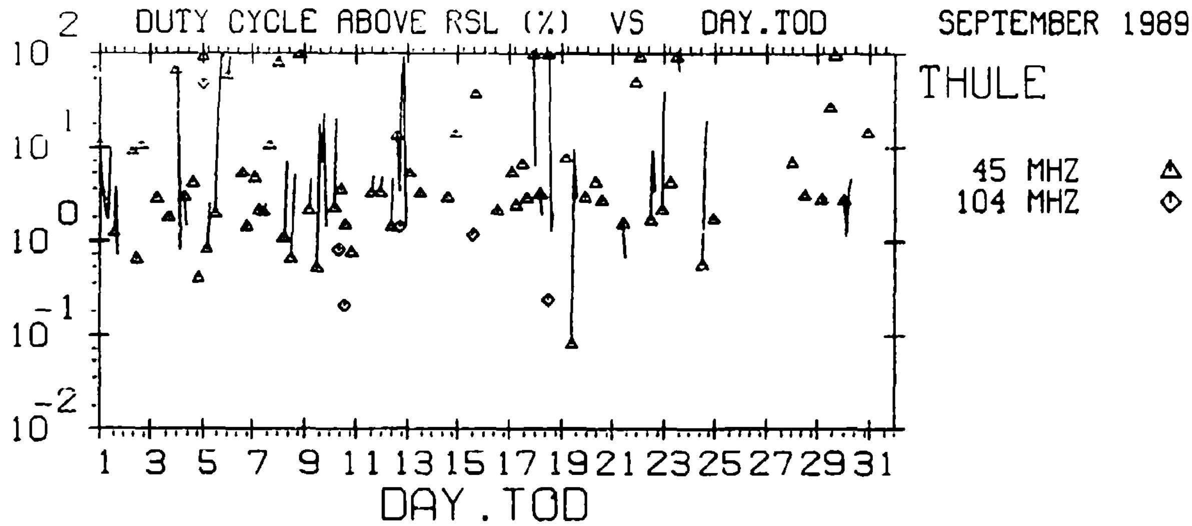
MENU# 103,09-2
14-JUN-93
PLOT# 57.00




THRESHOLD - −126.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

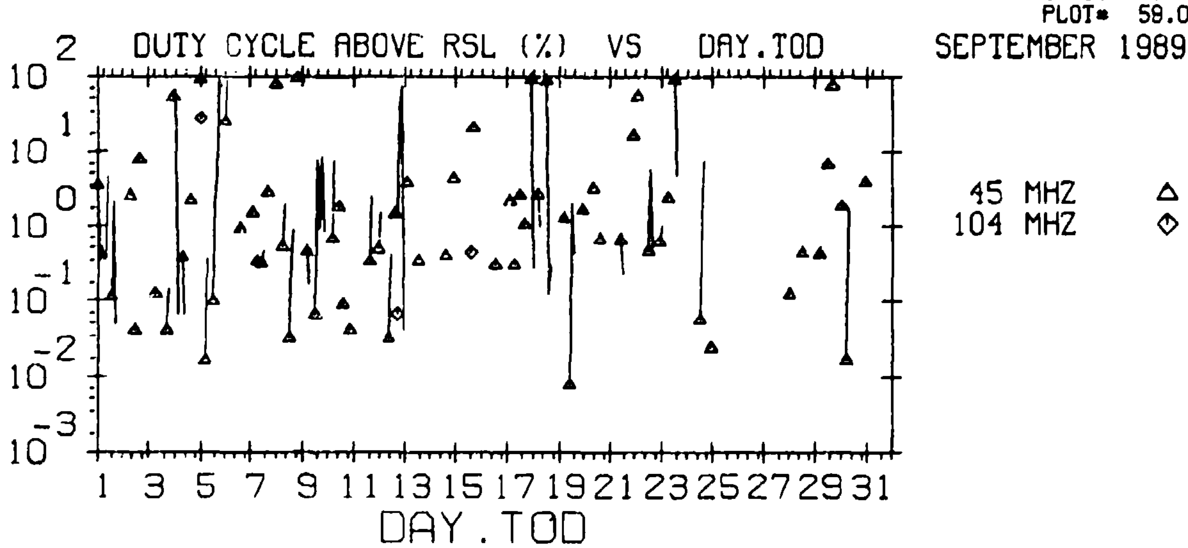
MENU# 103,09-2
14-JUN-93
PLOT# 58.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

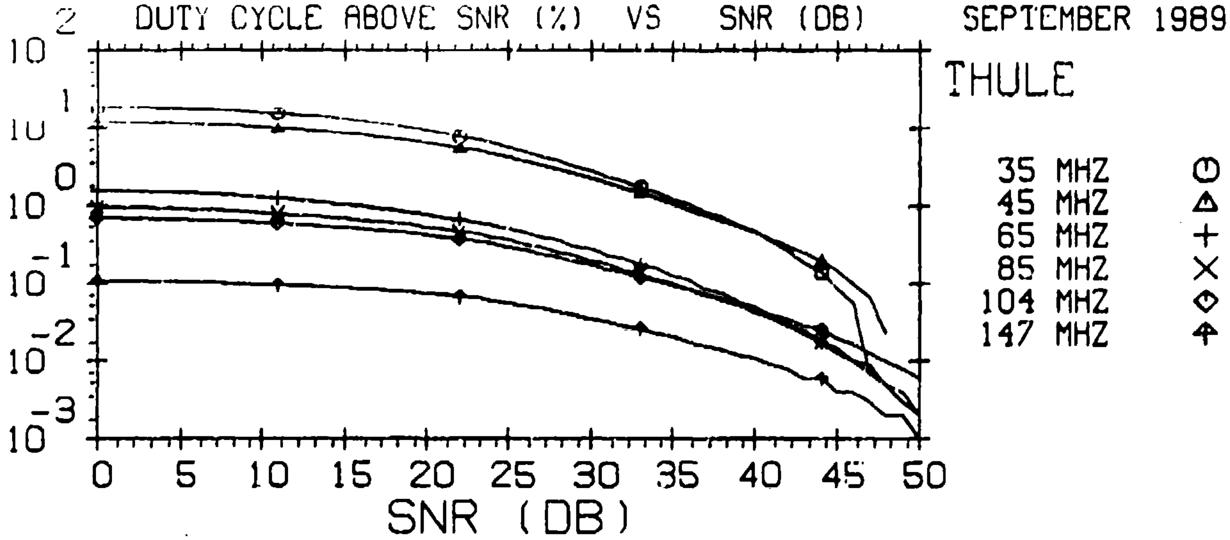
MENU* 103,09-2
14-JUN-93
PLOT* 59.00




THRESHOLD - -106.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

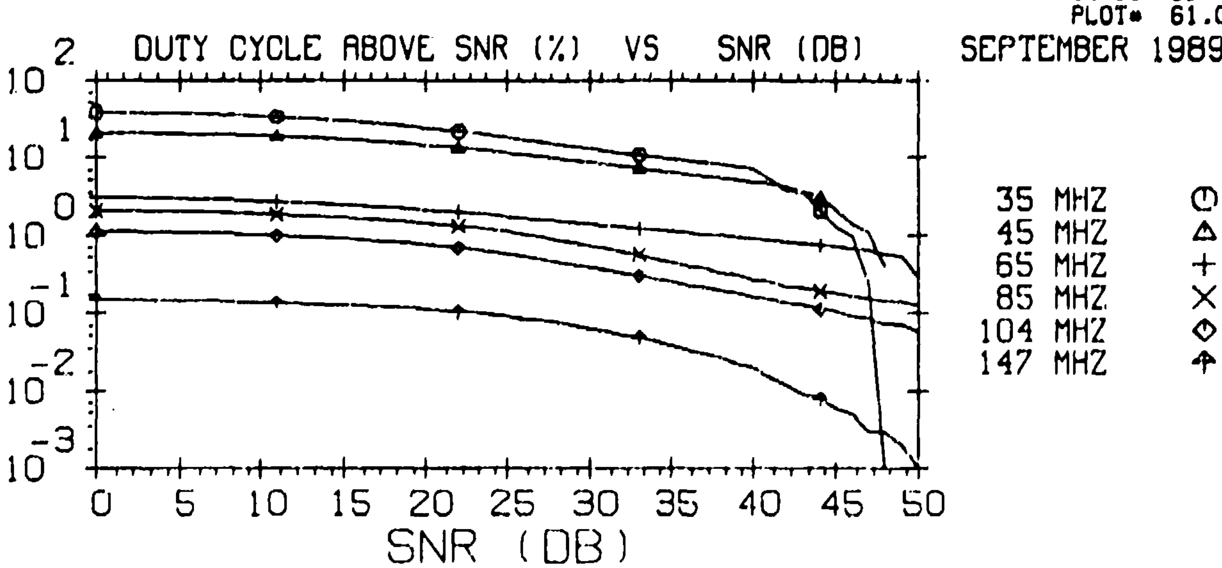
MENU* 103,09-2
14-JUN-93
PLOT* 60.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

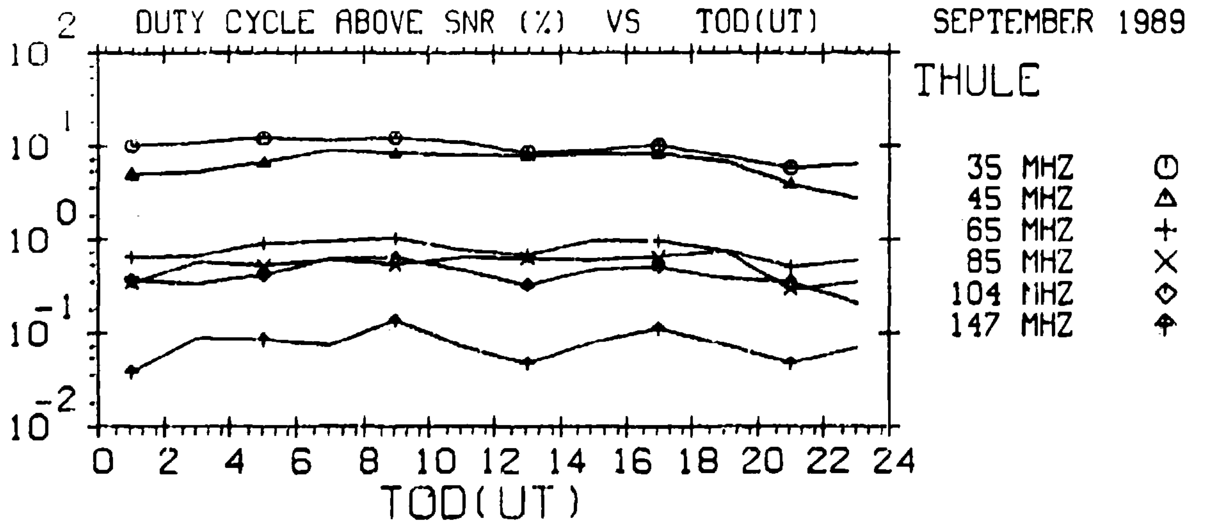
MENU=104,02-2
14-JUN-93
PLOT= 61.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

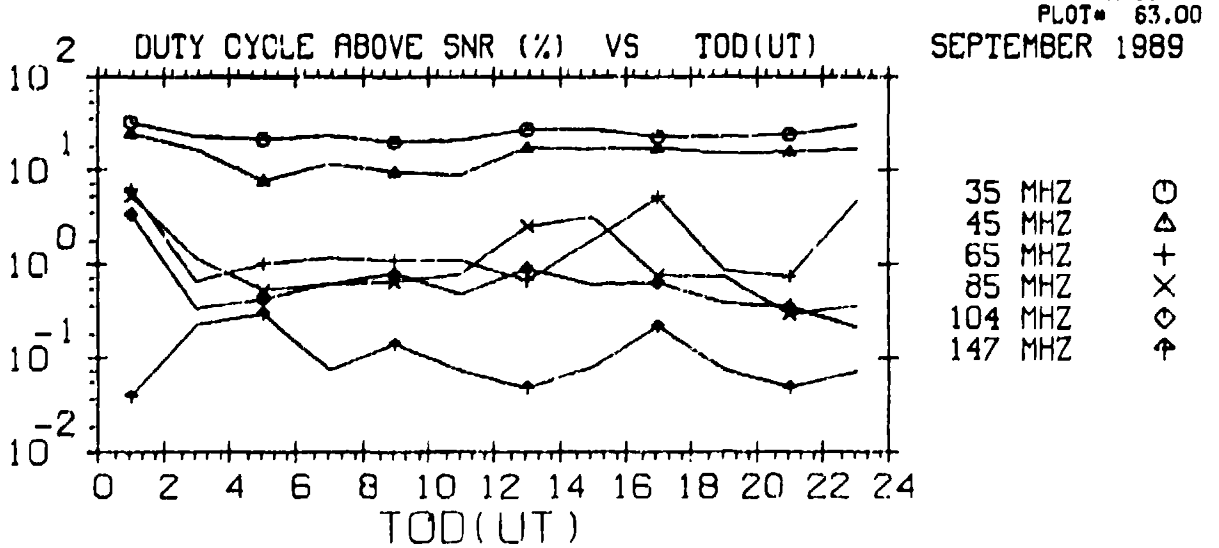
MENU=104,02-2
14-JUN-93
PLOT= 62.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




SIGNAL-TO-NOISE RATIO - 19.0 DB
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

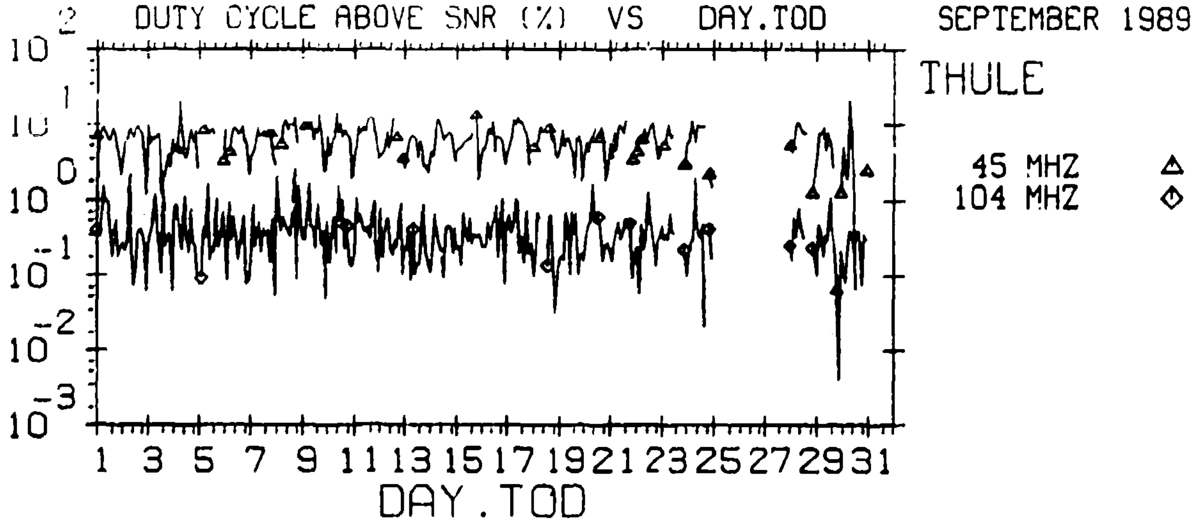
MENU=104,03-2
14-JUN-93
PLOT= 63.00




SIGNAL-TO-NOISE RATIO - 19.0 DB
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

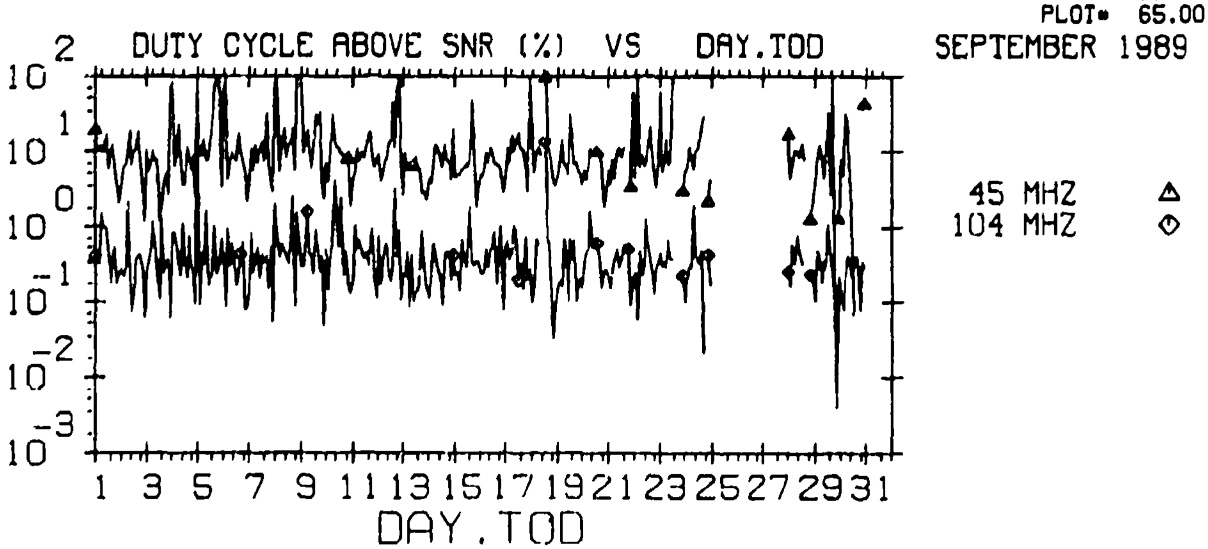
MENU=104,03-2
14-JUN-93
PLOT= 64.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




SIGNAL-TO-NOISE RATIO = 19.0 DB
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

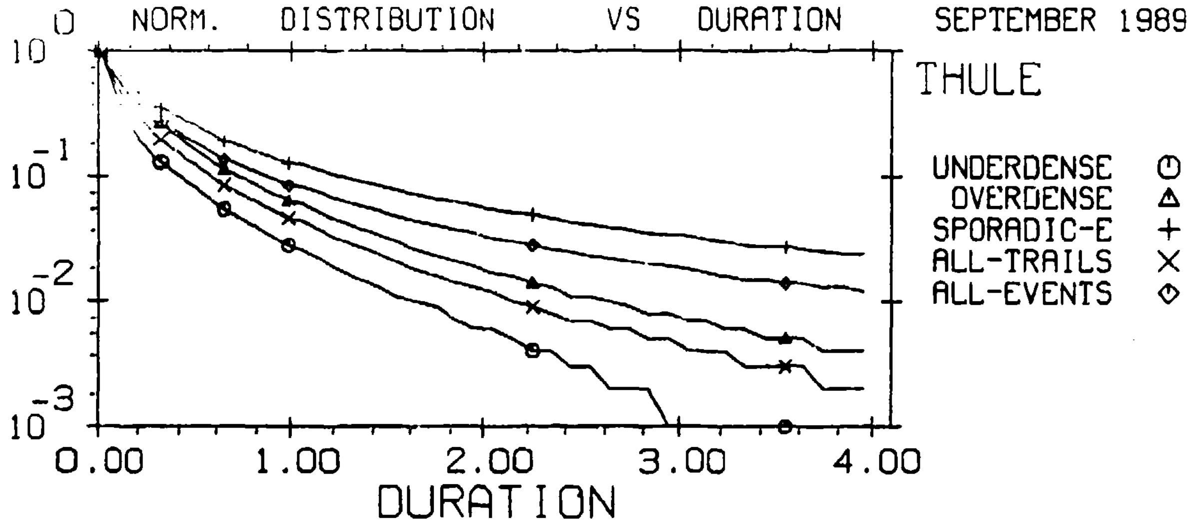
MENU=104,09-2
14-JUN-93
PLOT= 65.00




SIGNAL-TO-NOISE RATIO = 19.0 DB
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

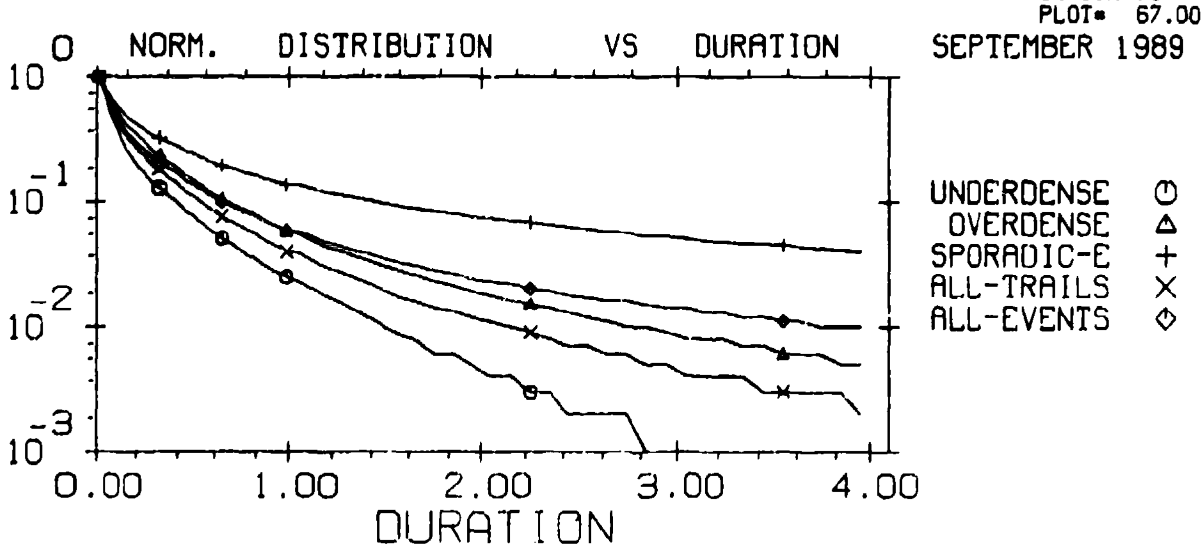
MENU=104,09-2
14-JUN-93
PLOT= 66.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 38236. OVER - 39483. SPOR-E - 72216.
TRAILS - 77719. EVENTS - 149935.

MENU=106,02-4
14-JUN-93
PLOT= 67.00

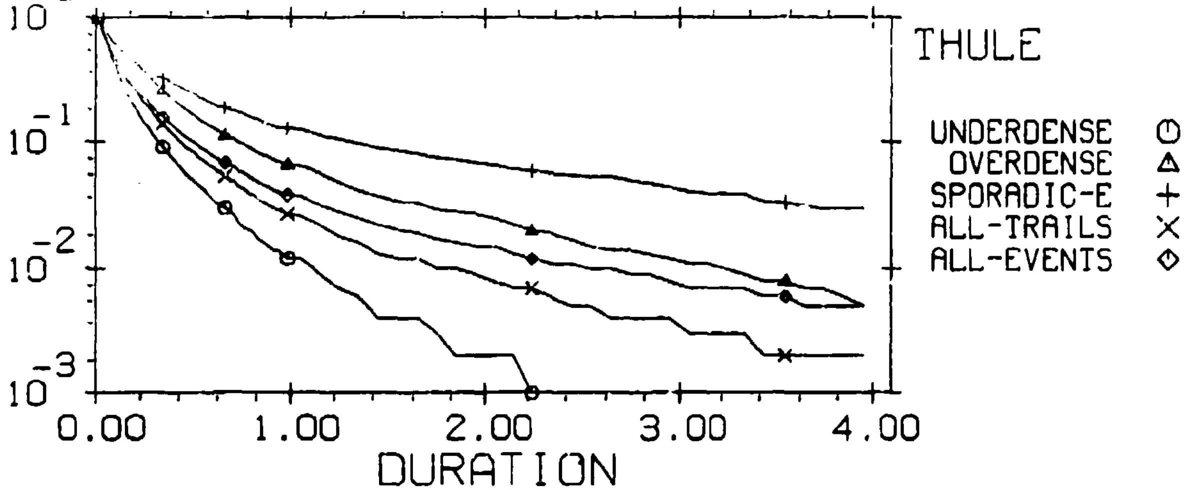



EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 29876. OVER - 26362. SPOR-E - 13820.
TRAILS - 56238. EVENTS 70058.

MENU=106,02-4
14-JUN-93
PLOT= 68.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

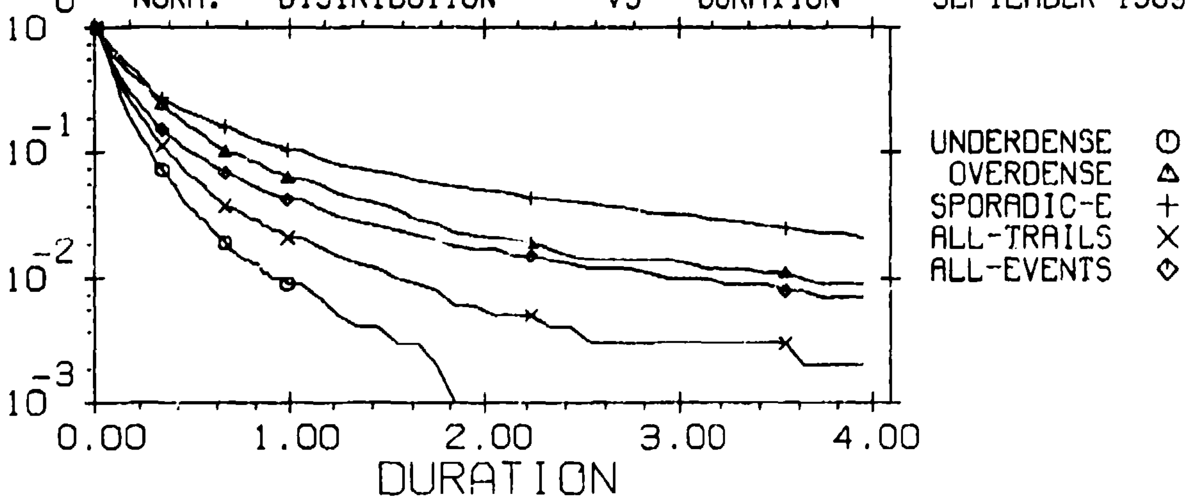
NORM. DISTRIBUTION VS DURATION SEPTEMBER 1989




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 8320. OVER - 3229. SPOR-E - 1422.
TRAILS - 11549. EVENTS - 12971.

MENU*106,02-4
14-JUN-93
PLOT* 69.00

NORM. DISTRIBUTION VS DURATION SEPTEMBER 1989

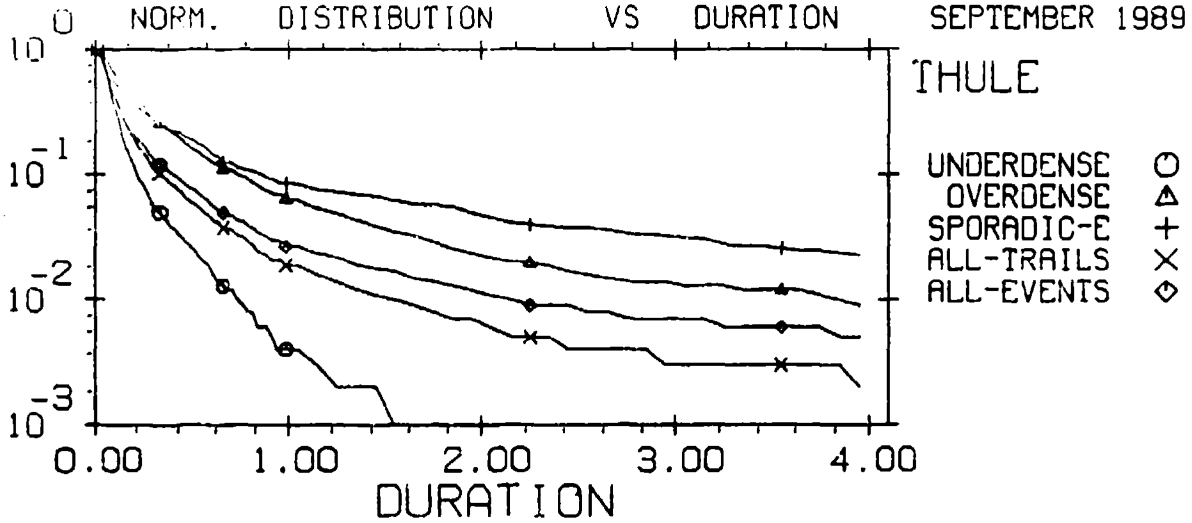



EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5513. OVER - 1674. SPOR-E - 2437.
TRAILS - 7187. EVENTS - 9624.

MENU*106,02-4
14-JUN-93
PLOT* 70.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

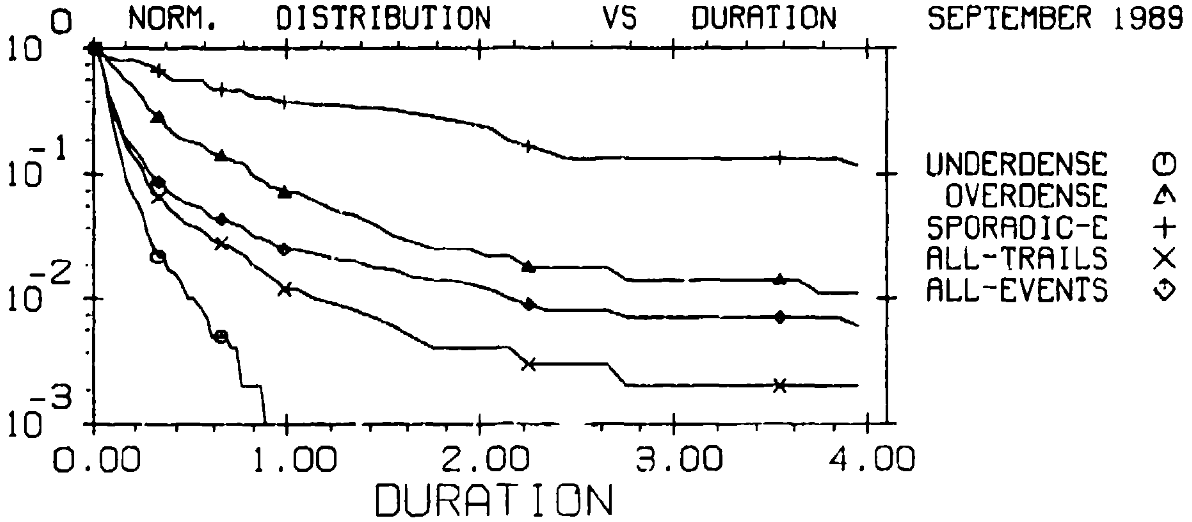
NORM. DISTRIBUTION VS DURATION SEPTEMBER 1989




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5621. OVER - 1889. SPOR-E - 1091.
TRAILS - 7510. EVENTS - 8601.

MENU*106,02-4
14-JUN-93
PLOT* 71.00

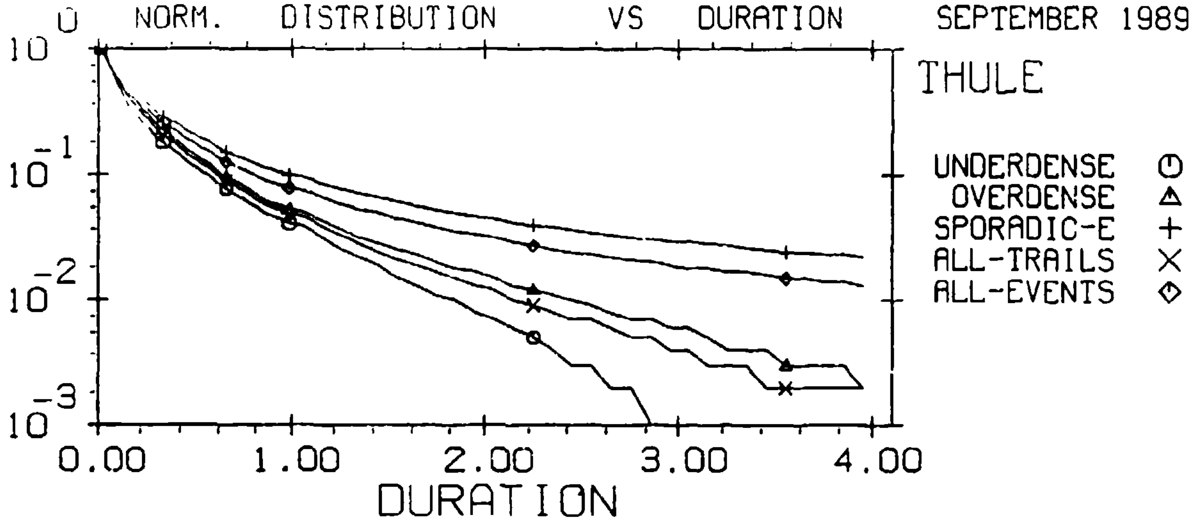
NORM. DISTRIBUTION VS DURATION SEPTEMBER 1989




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1347. OVER - 277. SPOR-E - 60.
TRAILS - 1624. EVENTS - 1684.

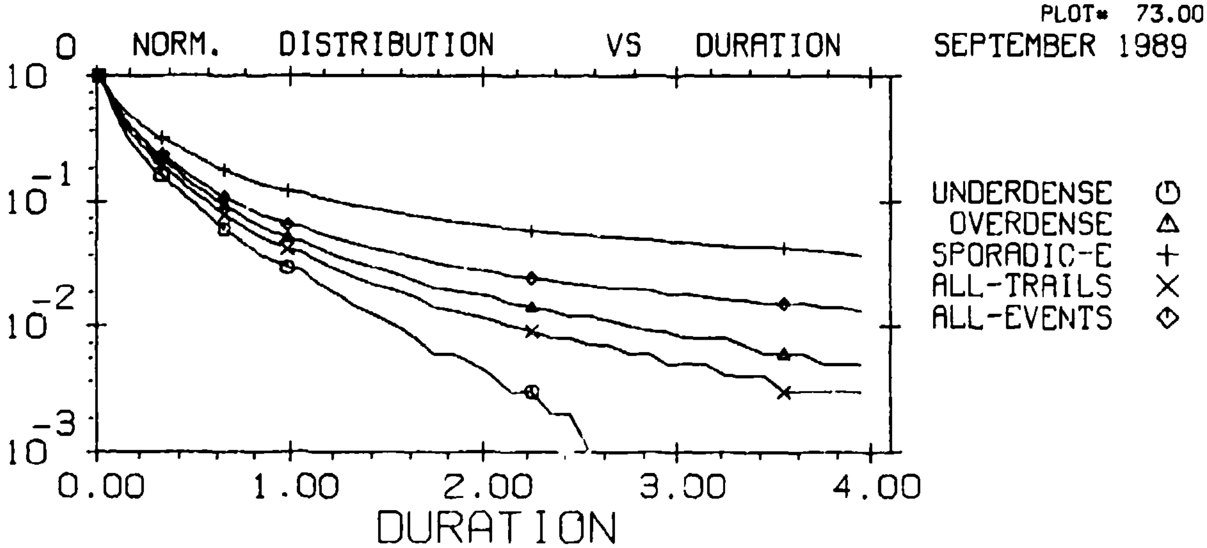
MENU*106,02-4
14-JUN-93
PLOT* 72.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 13180. OVER - 21781. SPOR-E - 49578.
TRAILS - 34961. EVENTS - 84539.

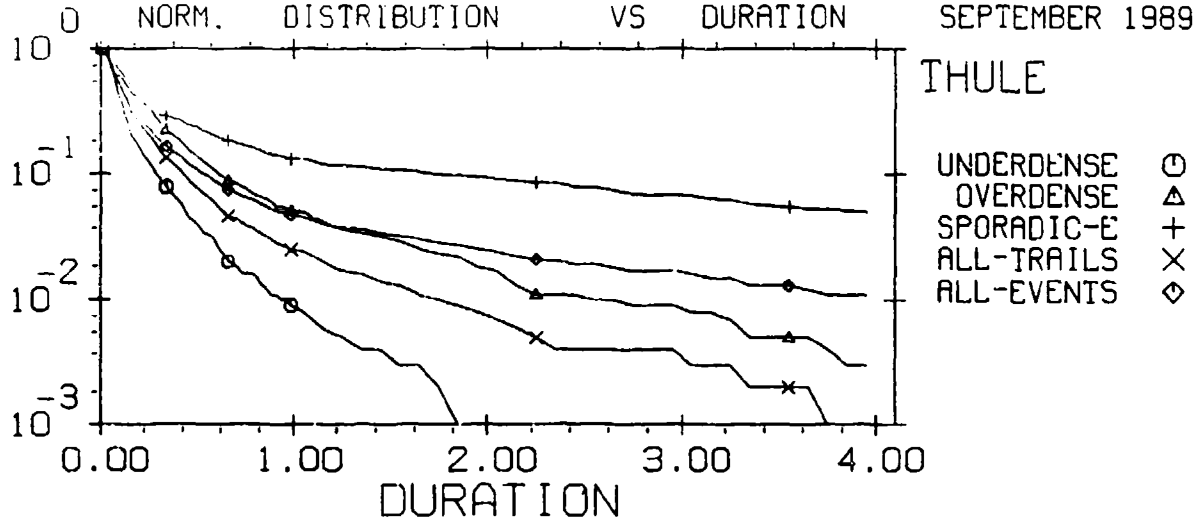
MENU=106,02-4
14-JUN-93
PLOT= 73.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 10201. OVER - 12980. SPOR-E - 10116.
TRAILS - 23181. EVENTS - 33297.

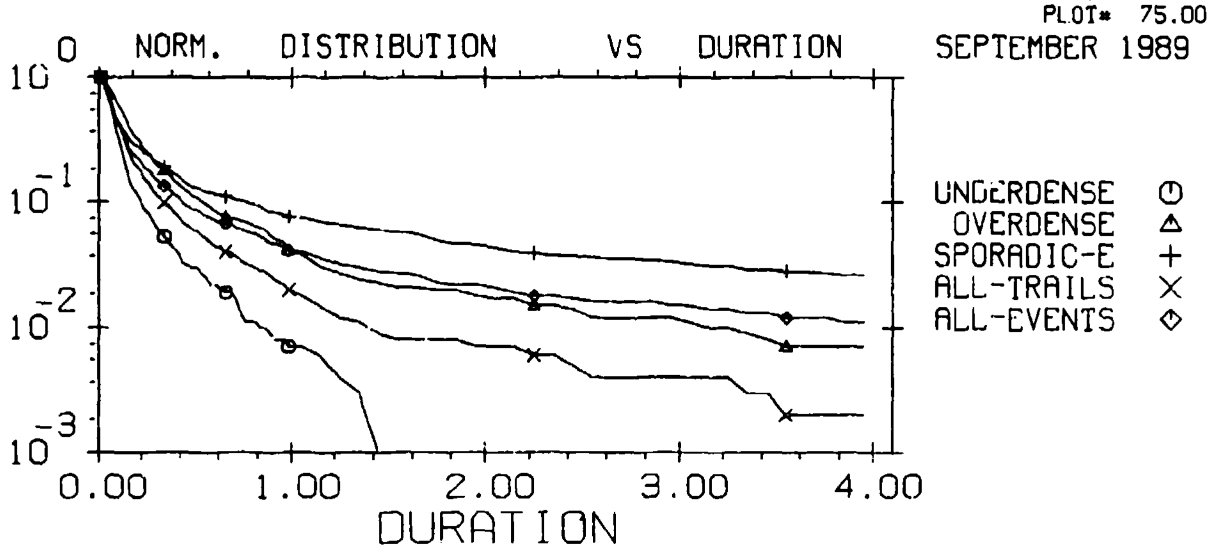
MENU=106,02-4
14-JUN-93
PLOT= 74.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 2688. OVER - 1660. SPOR-E - 1087.
TRAILS - 4348. EVENTS - 5435.

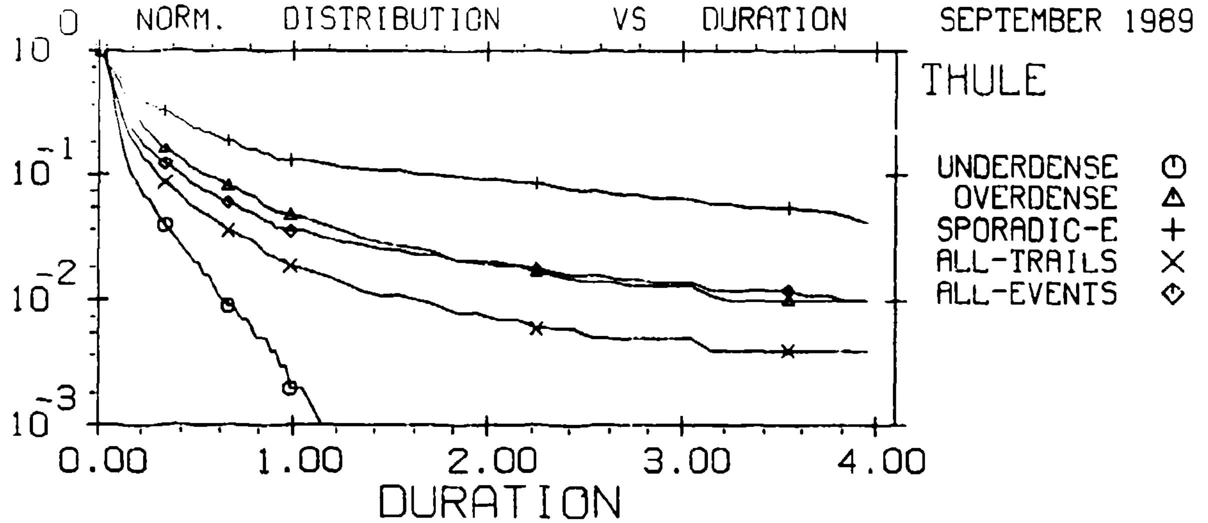
MENU*106,02-4
14-JUN-93
PLOT* 75.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1572. OVER - 922. SPOR-E - 1504.
TRAILS - 2494. EVENTS - 3998.

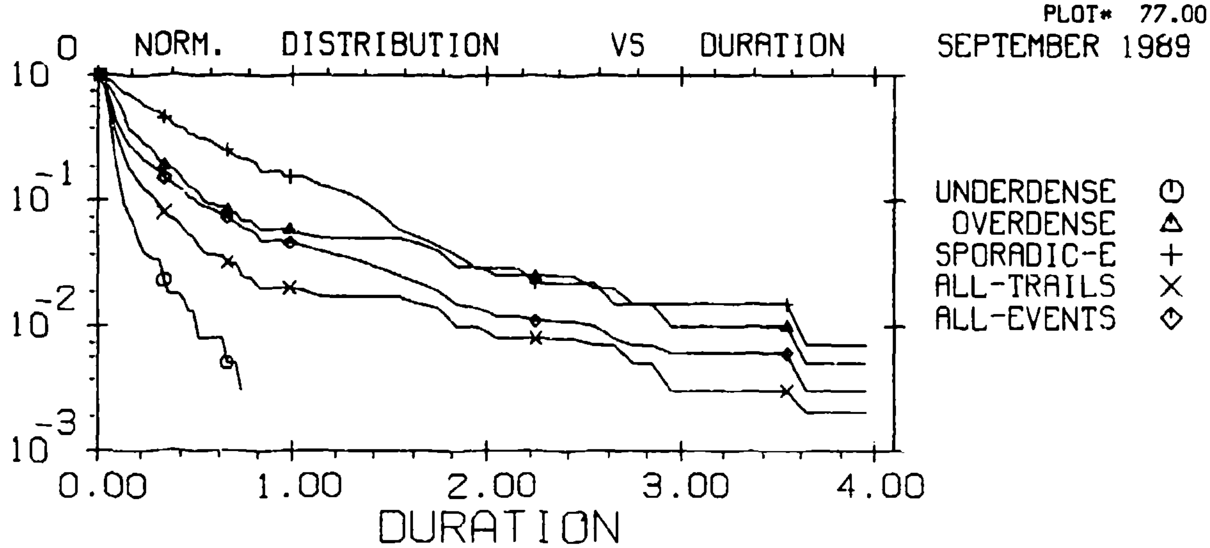
MENU*106,02-4
14-JUN-93
PLOT* 76.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1641. OVER - 1009. SPOR-E - 471.
TRAILS - 2650. EVENTS - 3121.

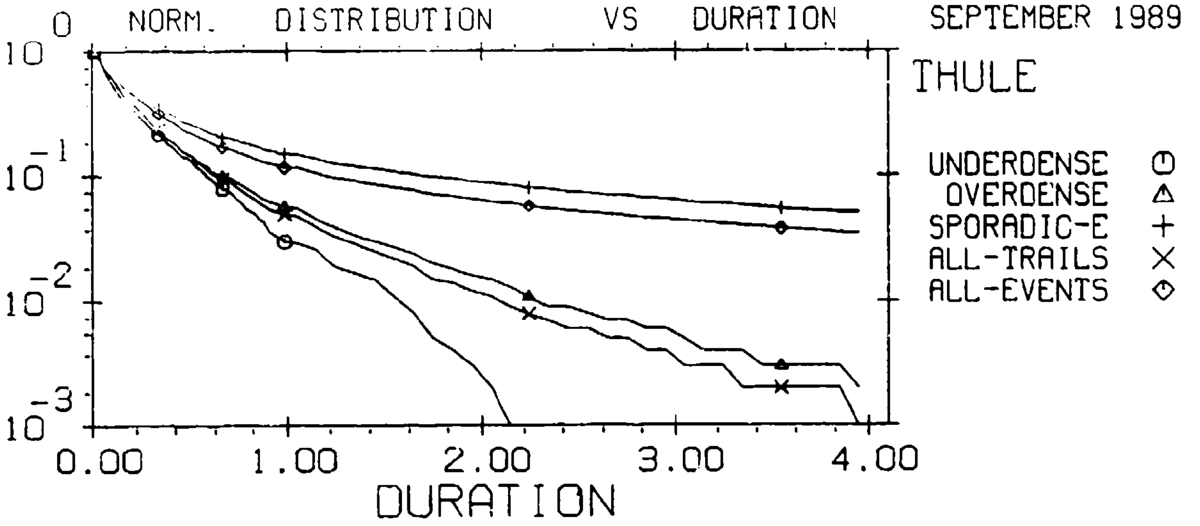
MENU*106,02-4
14-JUN-93
PLOT* 77.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 387. OVER - 202. SPOR-E - 136.
TRAILS - 589. EVENTS - 725.

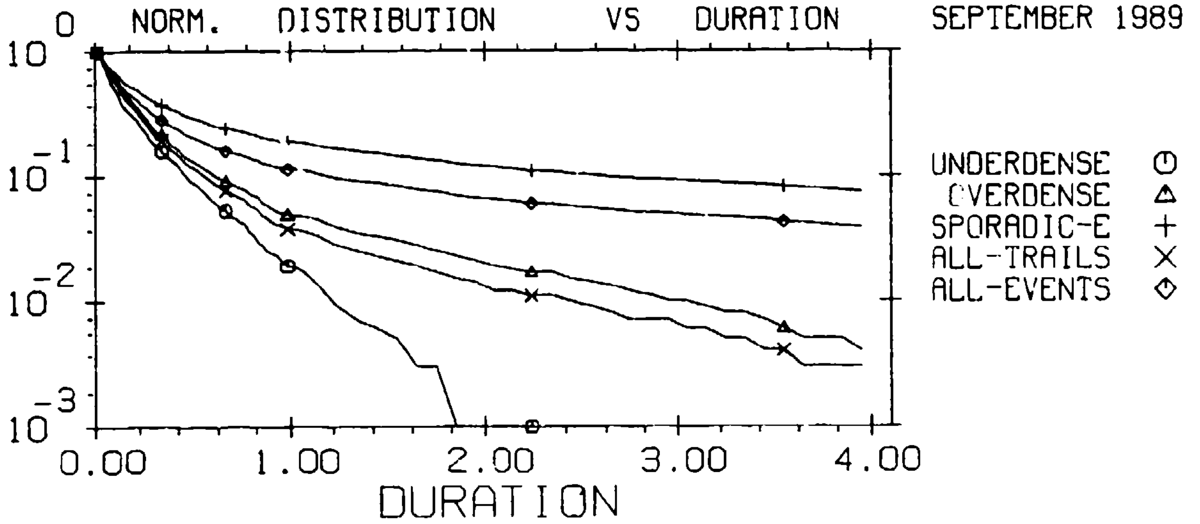
MENU*106,02-4
14-JUN-93
PLOT* 78.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 2333. OVER - 5044. SPOR-E - 15603.
TRAILS - 7377. EVENTS - 22980.

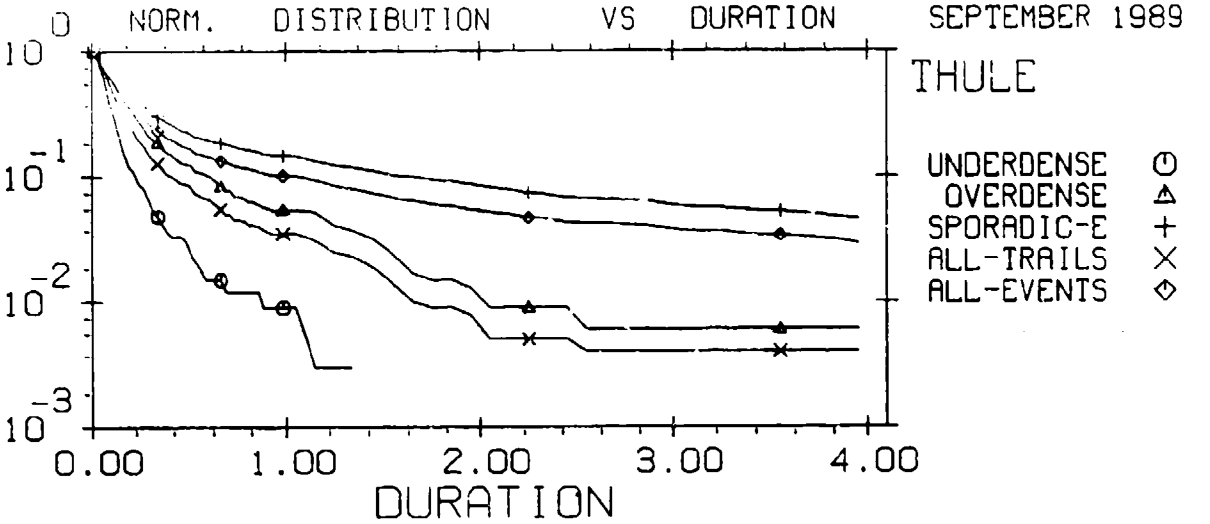
MENU=106,02-4
14-JUN-93
PLOT= 79.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1898. OVER - 3309. SPOR-E - 5241.
TRAILS - 5207. EVENTS - 10448.

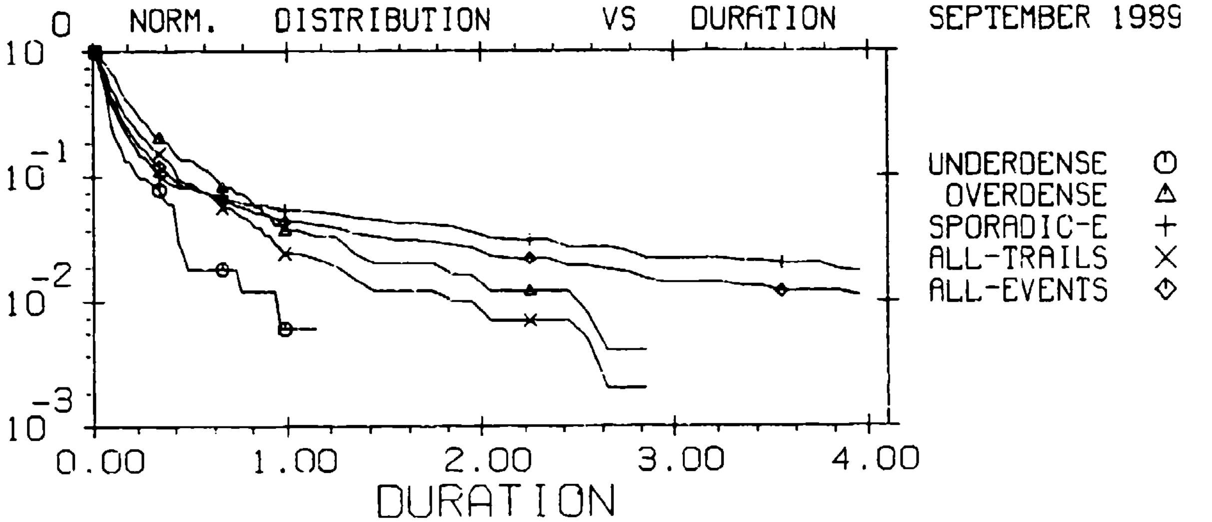
MENU=106,02-4
14-JUN-93
PLOT= 80.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 333. OVER - 463. SPOR-E - 1225.
TRAILS - 796. EVENTS - 2021.

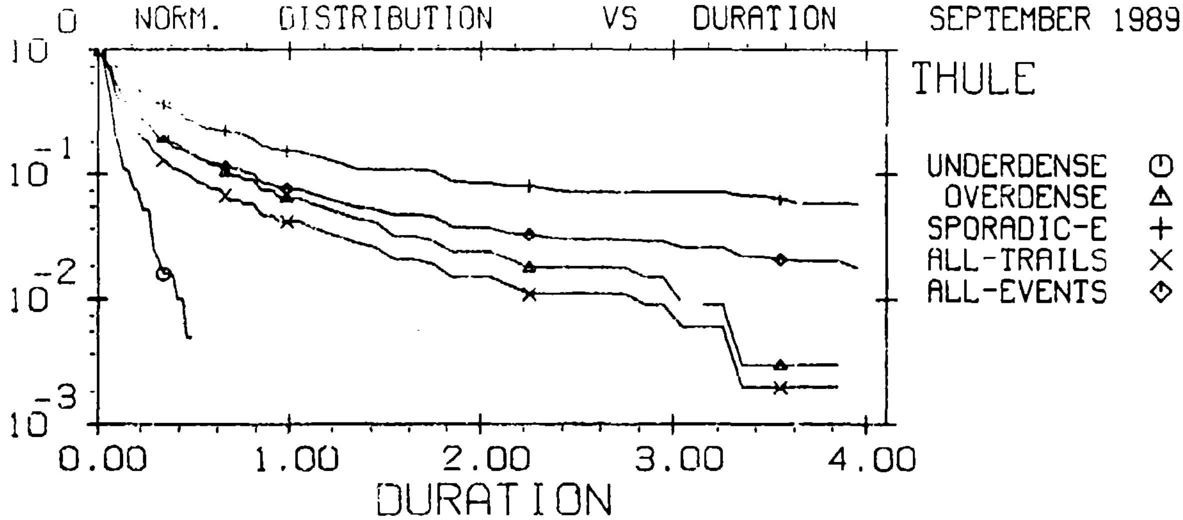
MENU=106,02-4
14-JUN-93
PLOT= 81.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 167. OVER - 246. SPOR-E - 716.
TRAILS - 413. EVENTS - 1129.

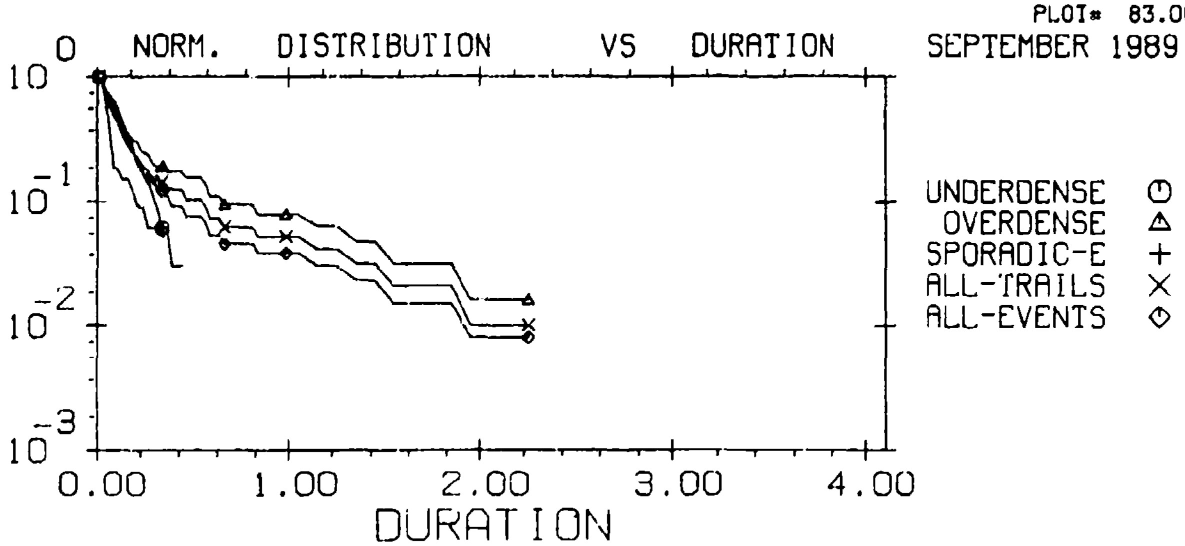
MENU=106,02-4
14-JUN-93
PLOT= 82.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 191. OVER - 339. SPOR-E - 236.
TRAILS - 530. EVENTS - 766.

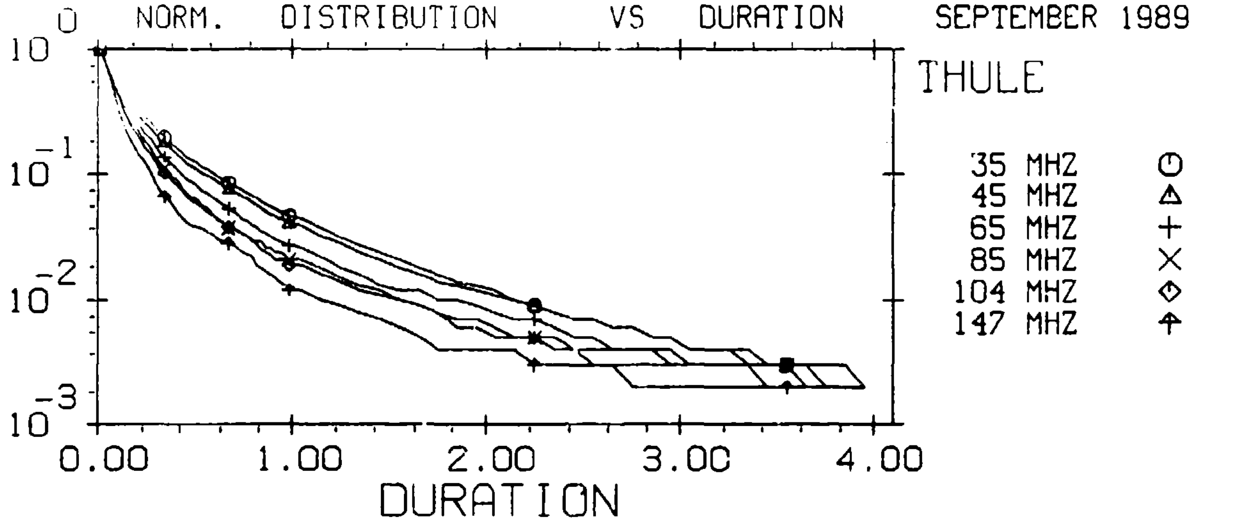
MENU*106,02-4
14-JUN-93
PLOT* 83.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 33. OVER - 64. SPOR-E - 35.
TRAILS - 97. EVENTS - 132.

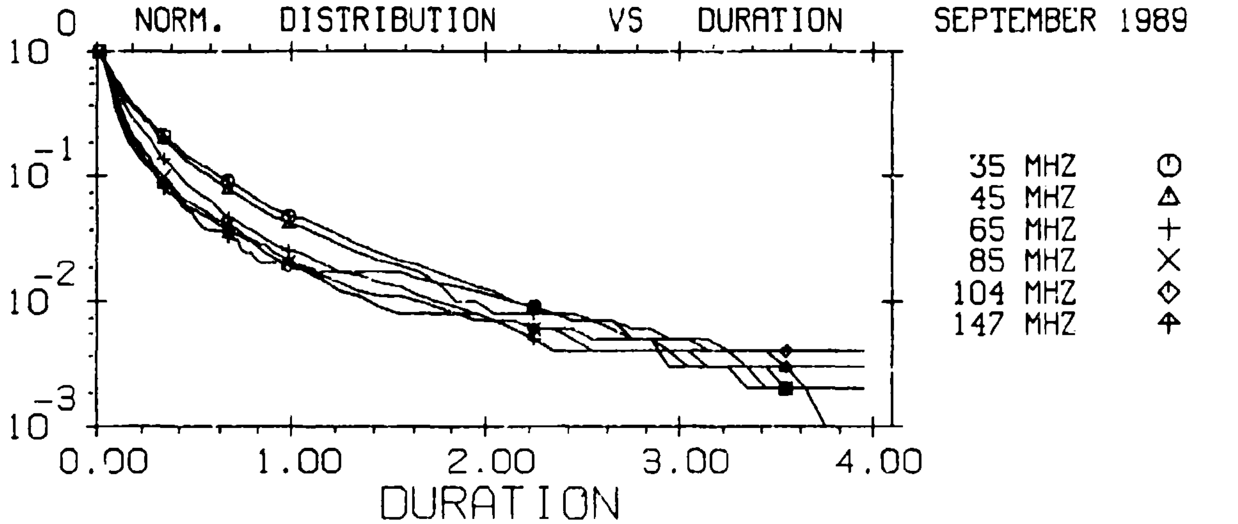
MENU*106,02-4
14-JUN-93
PLOT* 84.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING −126.0 DBM RSL
THE TIME OF DAY IS 0 − 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS − VERTICAL
NORMALIZING FACTORS:
35MHZ − 77719. 45MHZ − 56238. 65MHZ − 11549.
85MHZ − 7187. 104MHZ − 7510. 147MHZ − 1624.

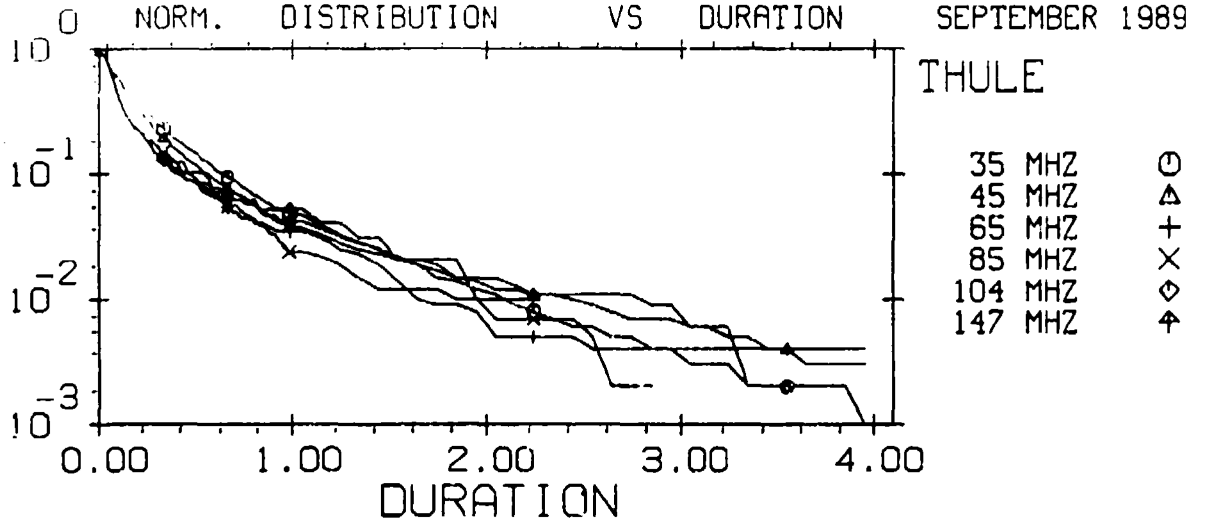
MENU*106,01-4
14-JUN-93
PLOT* 85.00




EXCEEDING −116.0 DBM RSL
THE TIME OF DAY IS 0 − 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS − VERTICAL
NORMALIZING FACTORS:
35MHZ − 34961. 45MHZ − 23181. 65MHZ − 4348.
85MHZ − 2494. 104MHZ − 2650. 147MHZ − 589.

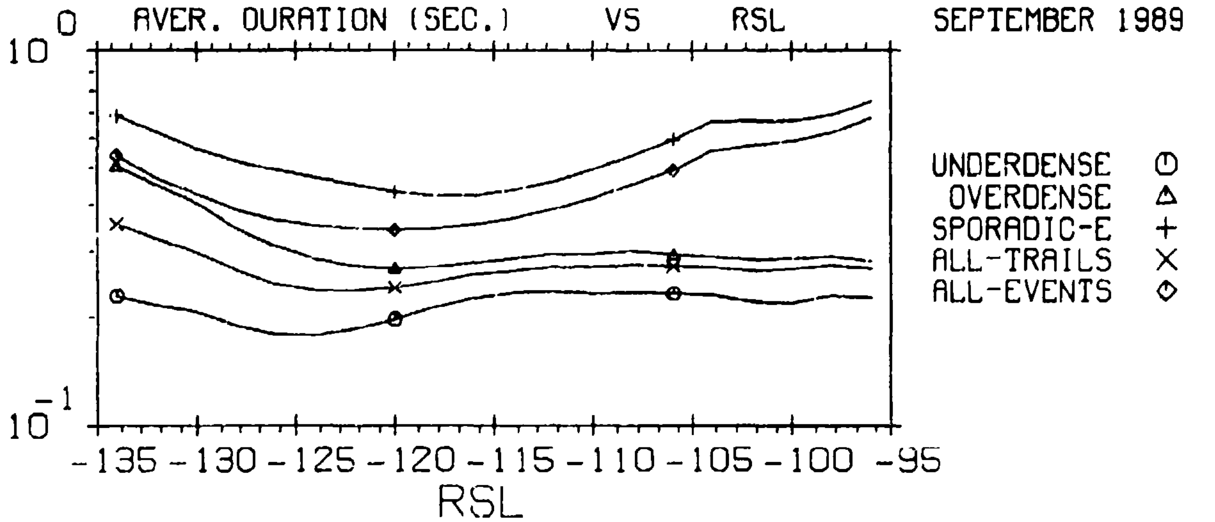
MENU*106,01-4
14-JUN-93
PLOT* 86.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 7377. 45MHZ - 5207. 65MHZ - 796.
85MHZ - 413. 104MHZ - 530. 147MHZ - 97.

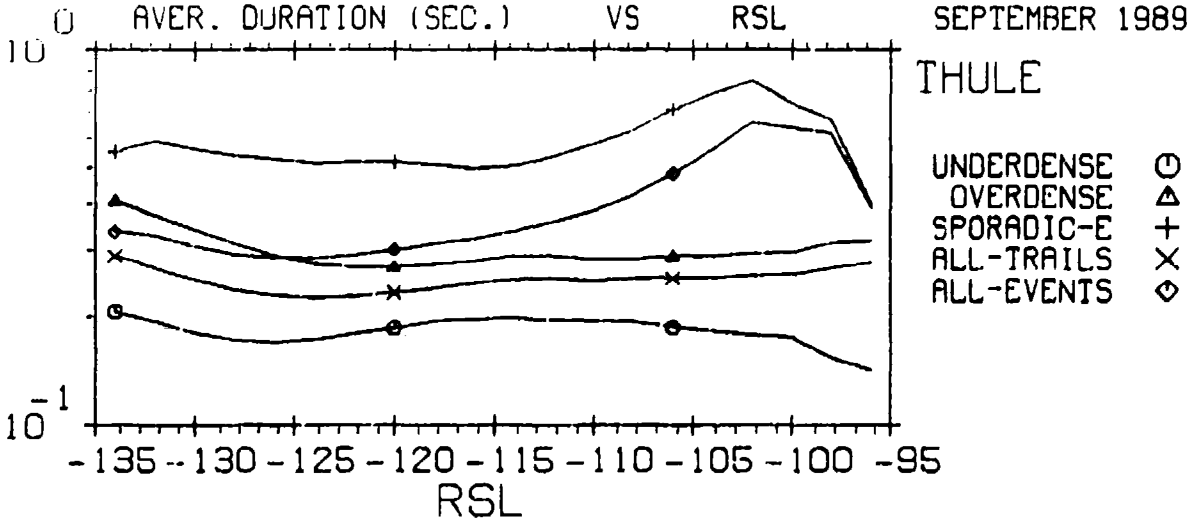
MENU* 106,01-4
14-JUN-93
PLOT* 87.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

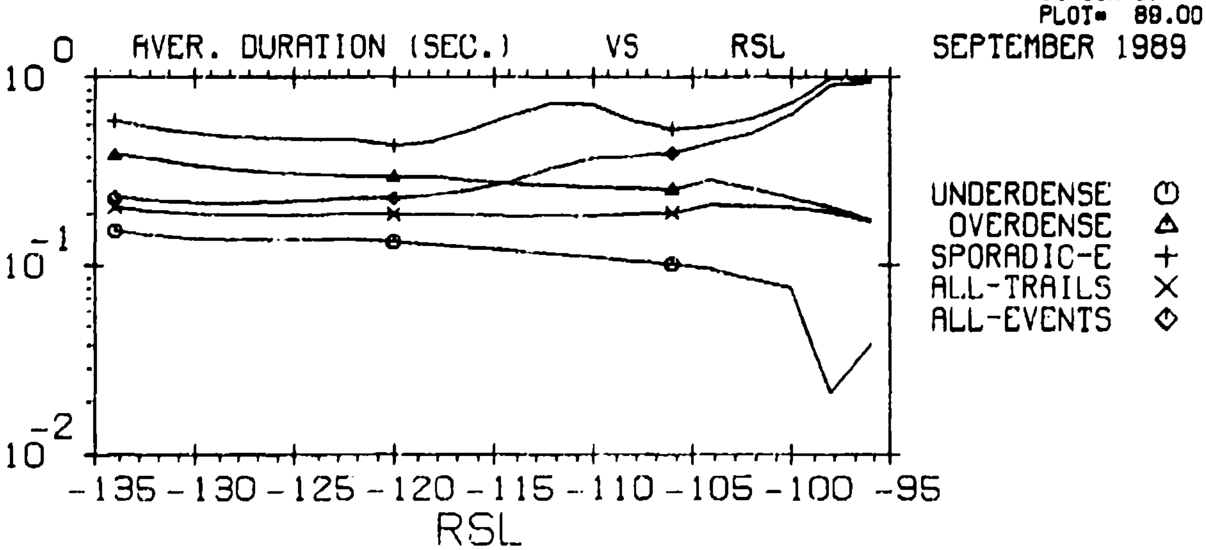
MENU* 106,06-1
14-JUN-93
PLOT* 88.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

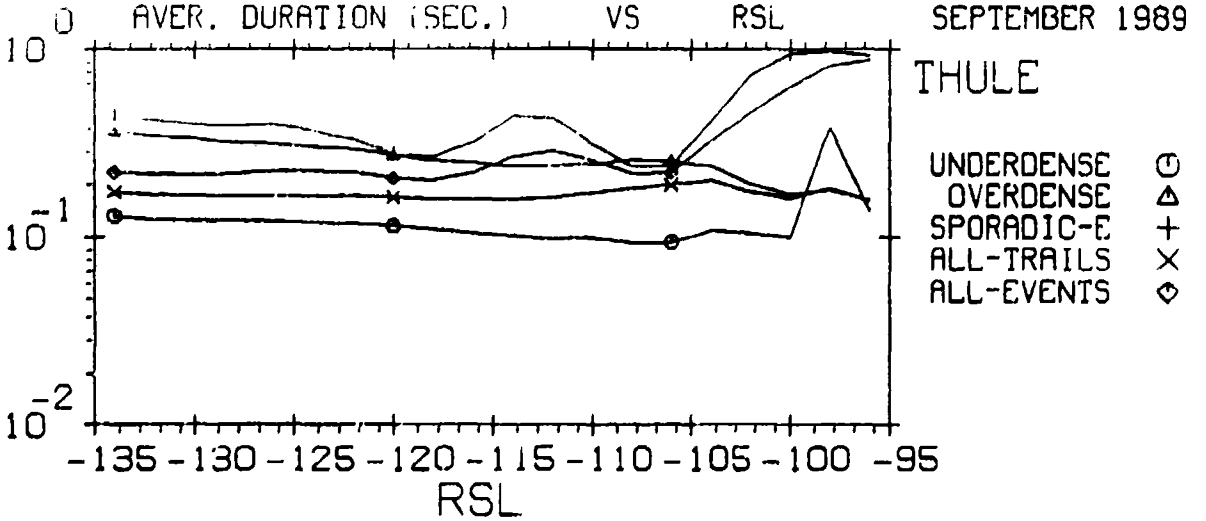
MENU=106,06-1
14-JUN-93
PLOT= 89.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

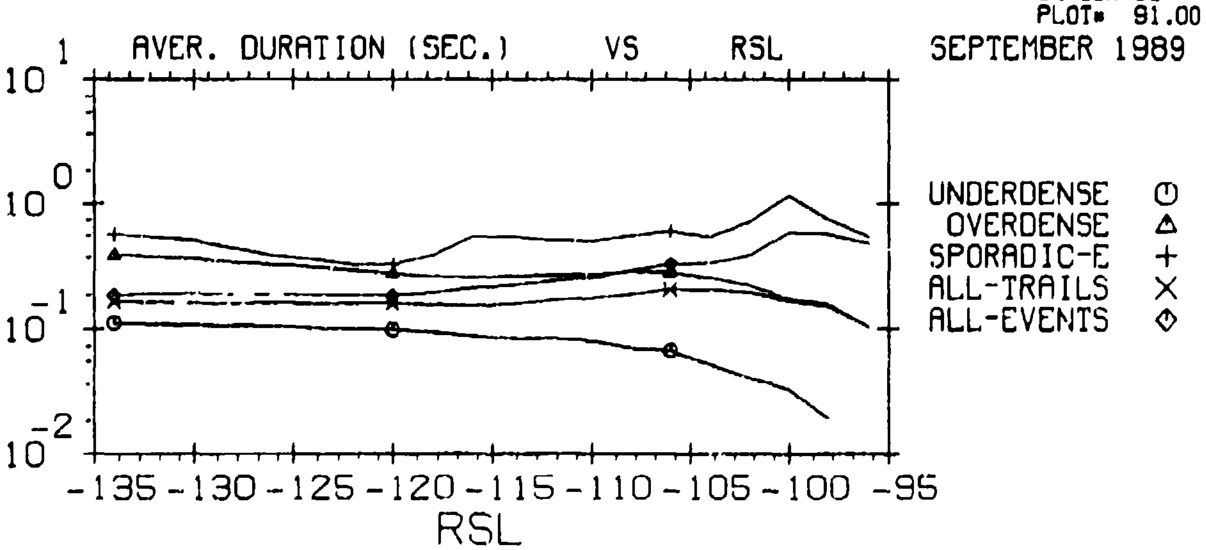
MENU=106,06-1
14-JUN-93
PLOT= 90.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

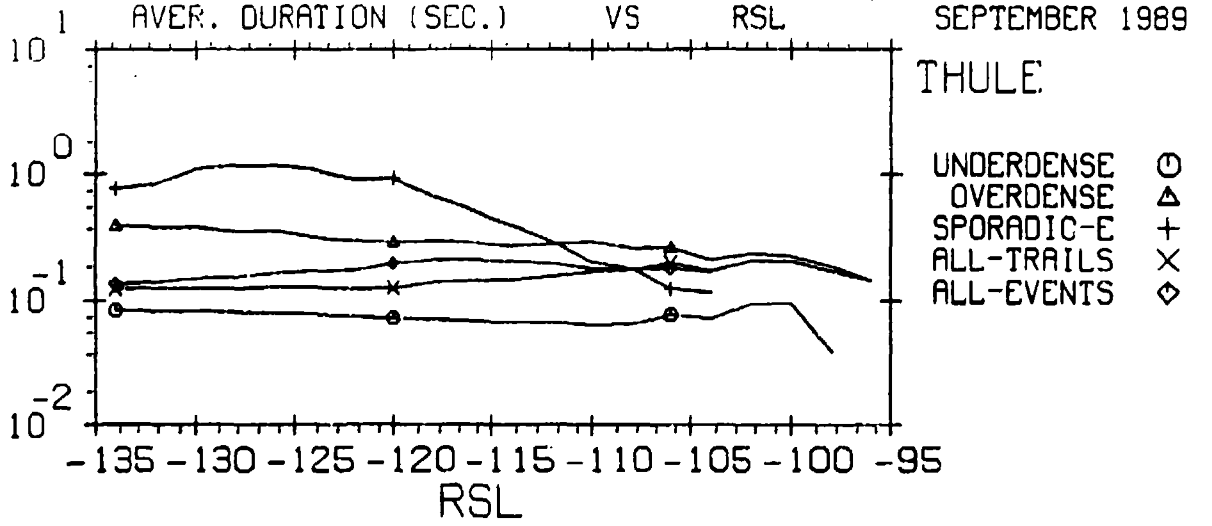
MENU=106,06-1
14-JUN-93
PLOT= 91.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY = 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

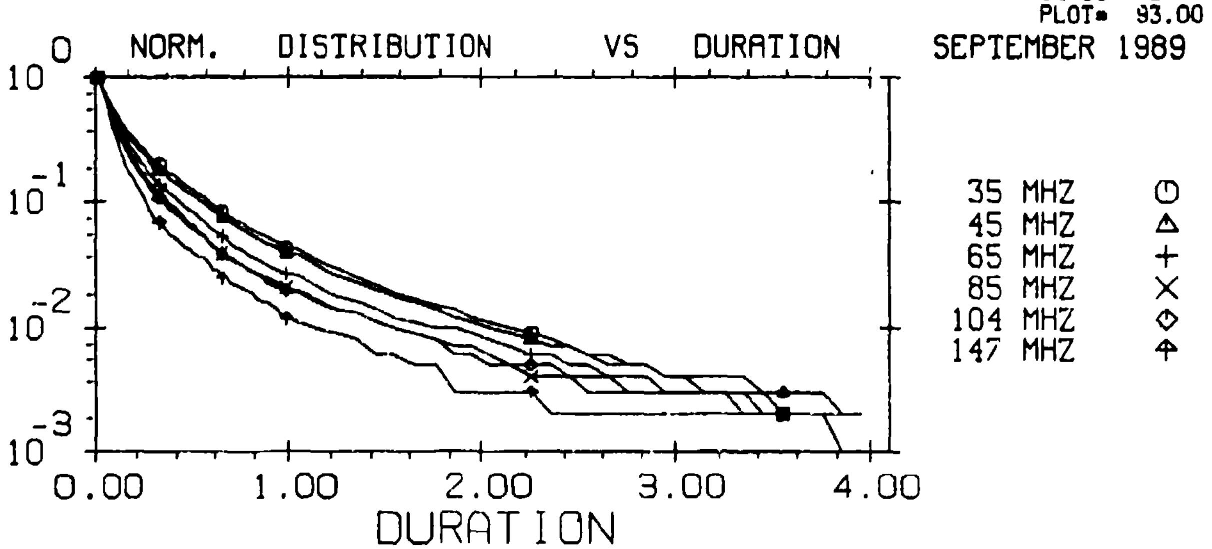
MENU=106,06-1
14-JUN-93
PLOT= 92.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

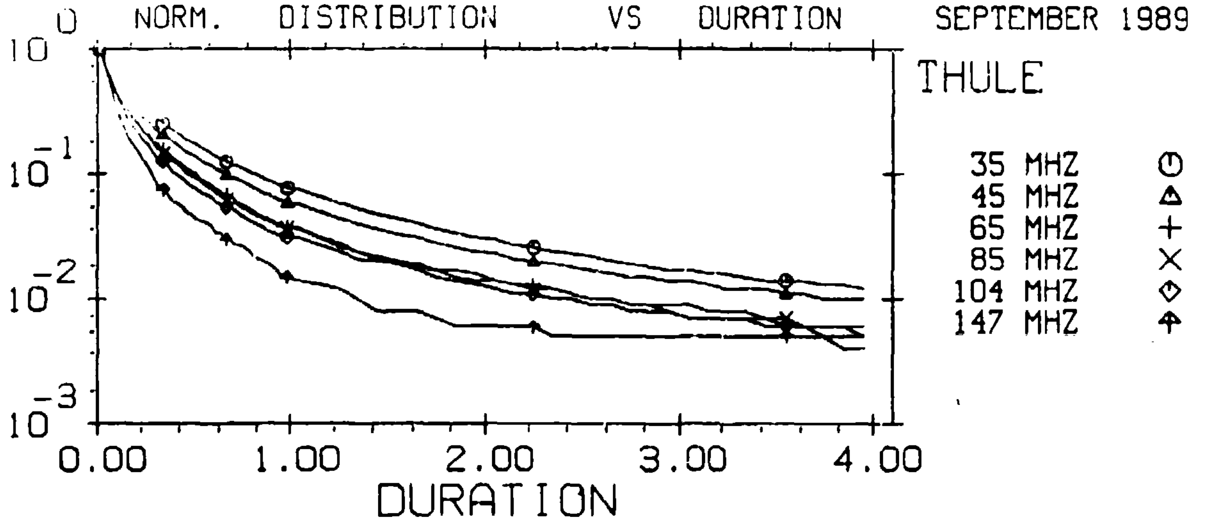
MENU* 106,06-1
14-JUN-93
PLOT* 93.00




EXCEEDING 19.0 DB SNR
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 52588. 45MHZ - 46934. 65MHZ - 11100.
85MHZ - 8348. 104MHZ - 9308. 147MHZ - 2105.

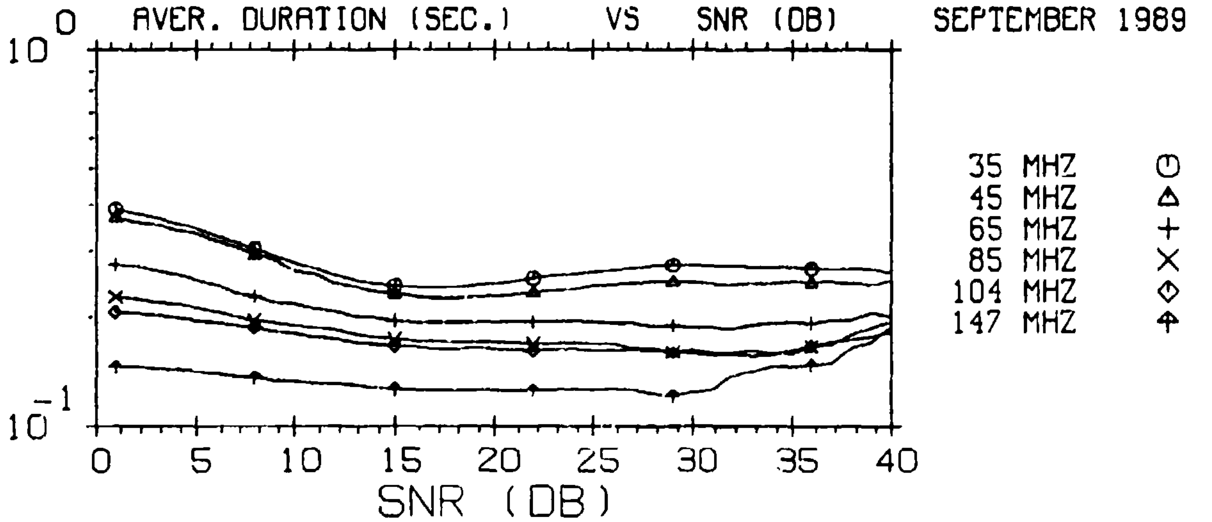
MENU* 107,01-4
14-JUN-93
PLOT* 94.00

## GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING 19.0 DB SNR
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 113447. 45MHZ - 60365. 65MHZ - 12468.
85MHZ - 10780. 104MHZ - 10252. 147MHZ - 2145.

MENU= 107,01-4
14-JUN-93
PLOT= 95.00

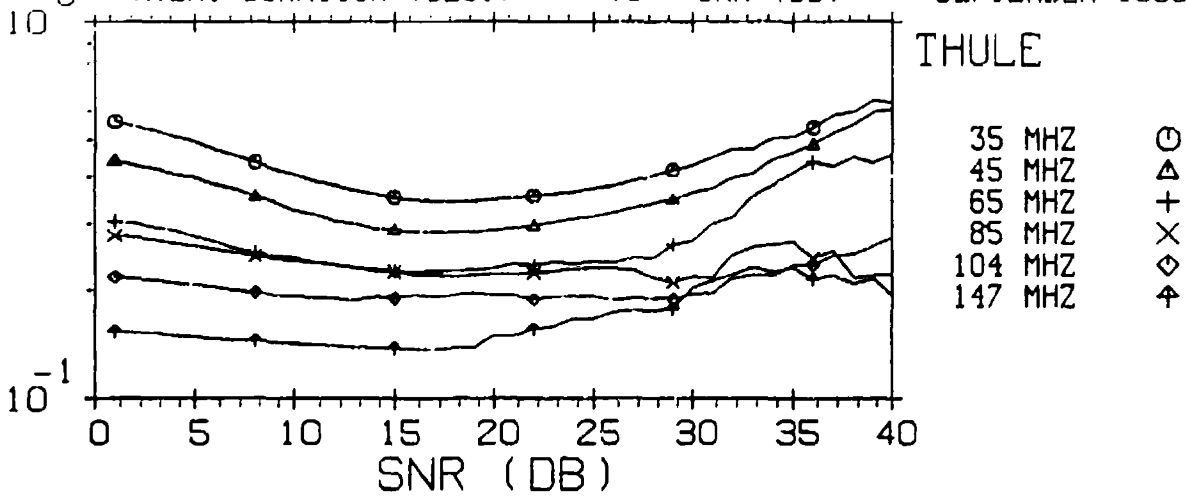



THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU= 107,05-1
14-JUN-93
PLOT= 96.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

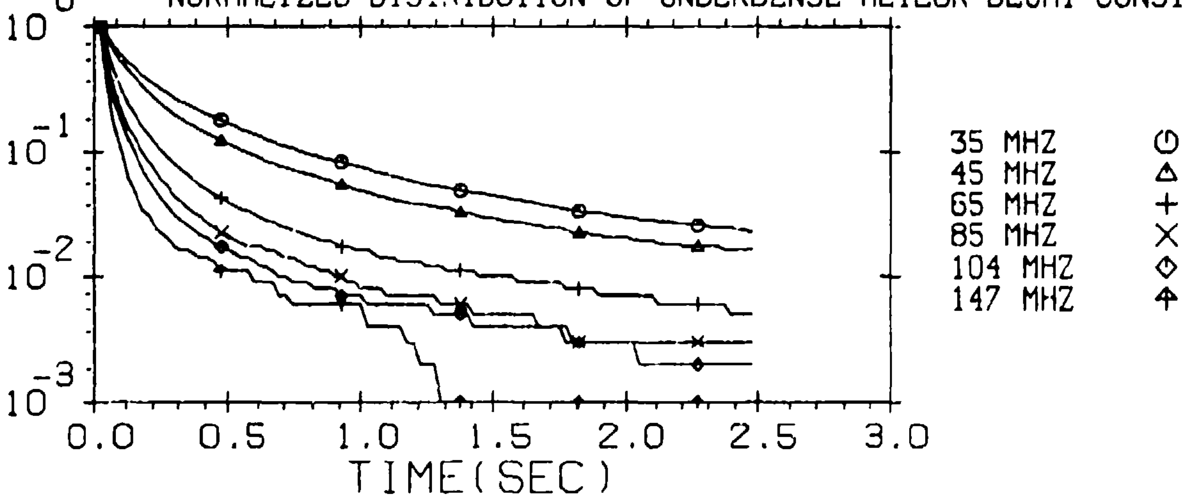
AVER. DURATION (SEC.) VS SNR (DB) SEPTEMBER 1989




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU=107,05-1
14-JUN-93
PLOT= 97.00

NORMALIZED DISTRIBUTION OF UNDERDENSE METEOR DECAY CONSTANTS

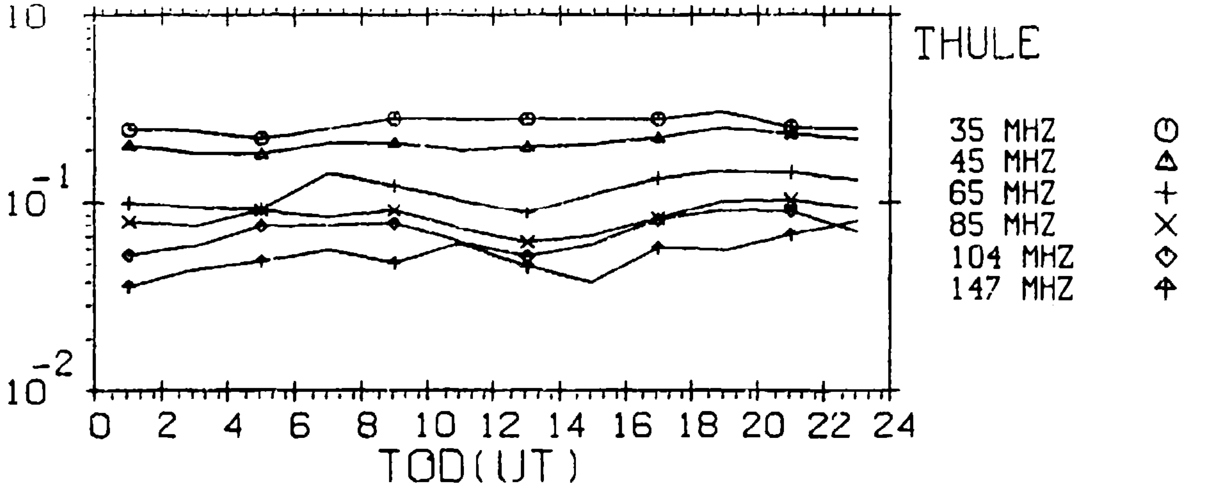



SEPTEMBER 1989
THE TIME OF DAY IS 0 : 24 HOURS U.T.
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ : 18146. 45MHZ : 18937. 65MHZ : 9492.
85MHZ : 7198. 104MHZ : 7703. 147MHZ : 1617.

MENU=108,01-4
14-JUN-93
PLOT= 98.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

AVERAGE UNDERDENSE TIME CONSTANT VS TIME FOR SEPTEMBER 1989

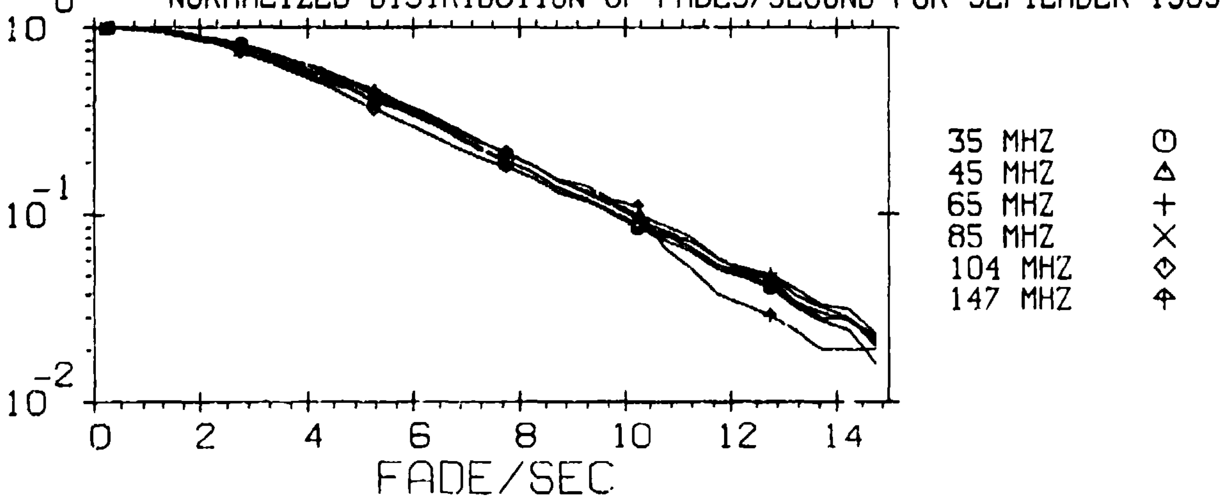



BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
THE 24 HOUR AVERAGE TIME CONSTANTS ARE

0.259 0.205 0.113 0.082 0.070 0.053

MENU*108,02-1
14-JUN-93
PLOT* 99.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989



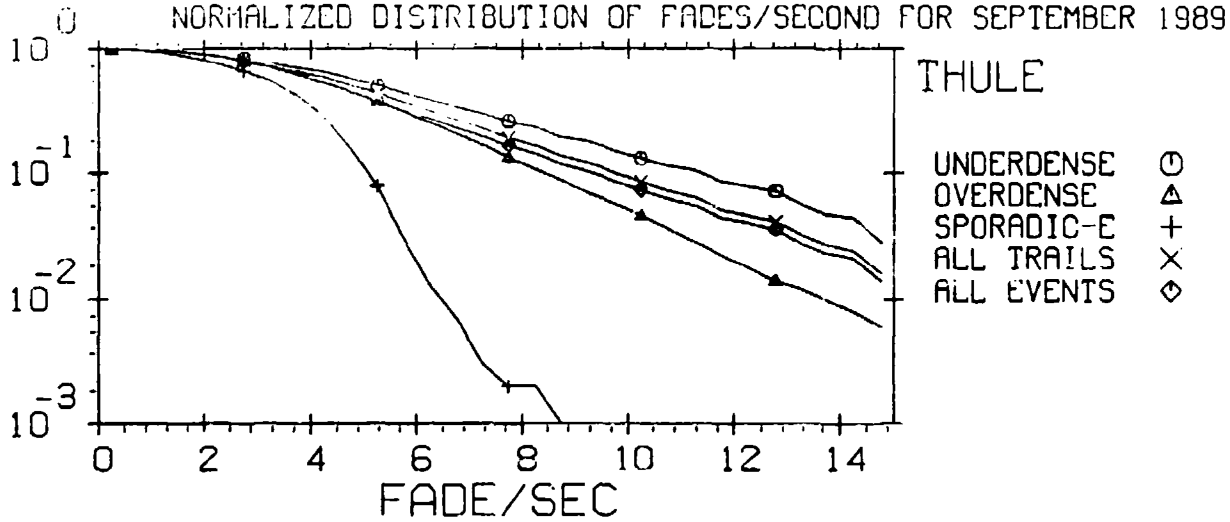

THE TIME OF DAY IS 0 : 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
NORMALIZING FACTORS:

35MHZ : 20567. 45MHZ : 16565. 65MHZ : 3553.
85MHZ : 1774. 104MHZ : 1512. 147MHZ : 210.

MENU*109,01-4
14-JUN-93
PLOT* 100.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

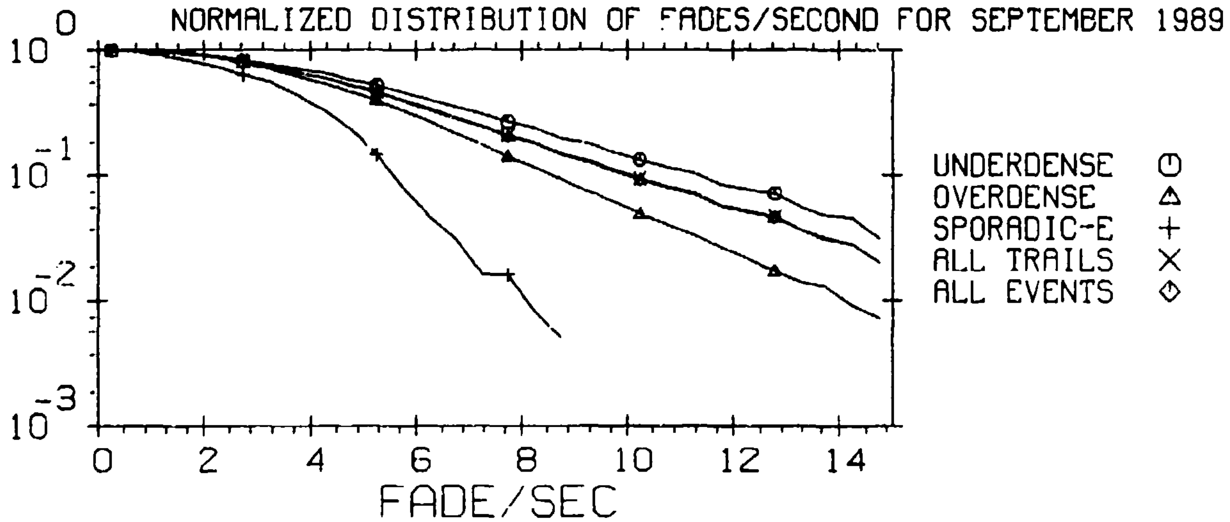
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 35 MHZ
NORMALIZING FACTORS:
UNDER : 9458. OVER : 11109. SPOR-E : 3366.
TRAILS : 20567. EVENTS : 23933.

MENU* 109,02-4
14-JUN-93
PLOT* 101.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989

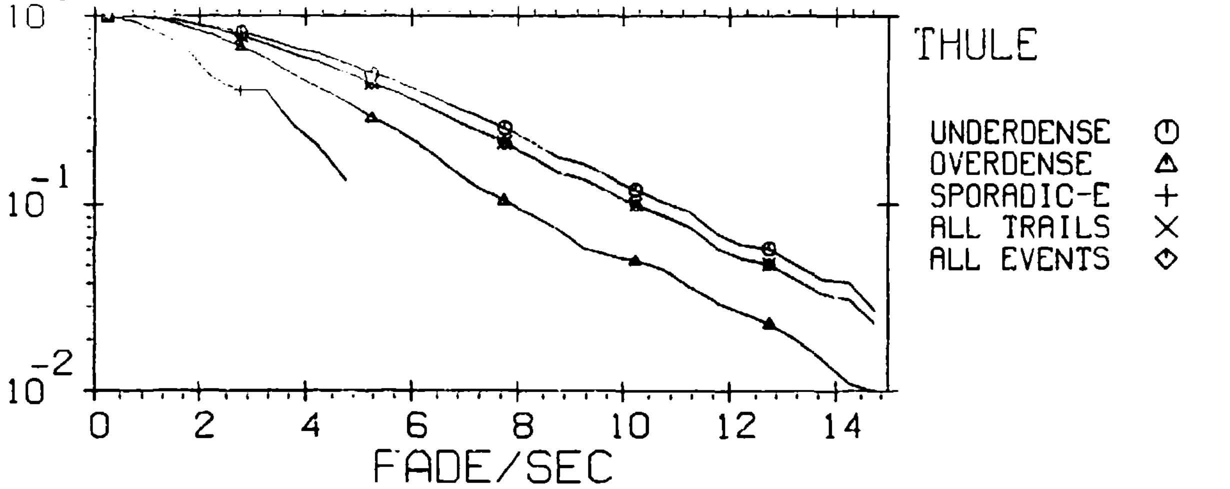



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 45 MHZ
NORMALIZING FACTORS:
UNDER : 9045. OVER : 7520. SPOR-E : 385.
TRAILS : 16565. EVENTS : 16950.

MENU* 109,02-4
14-JUN-93
PLOT* 102.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

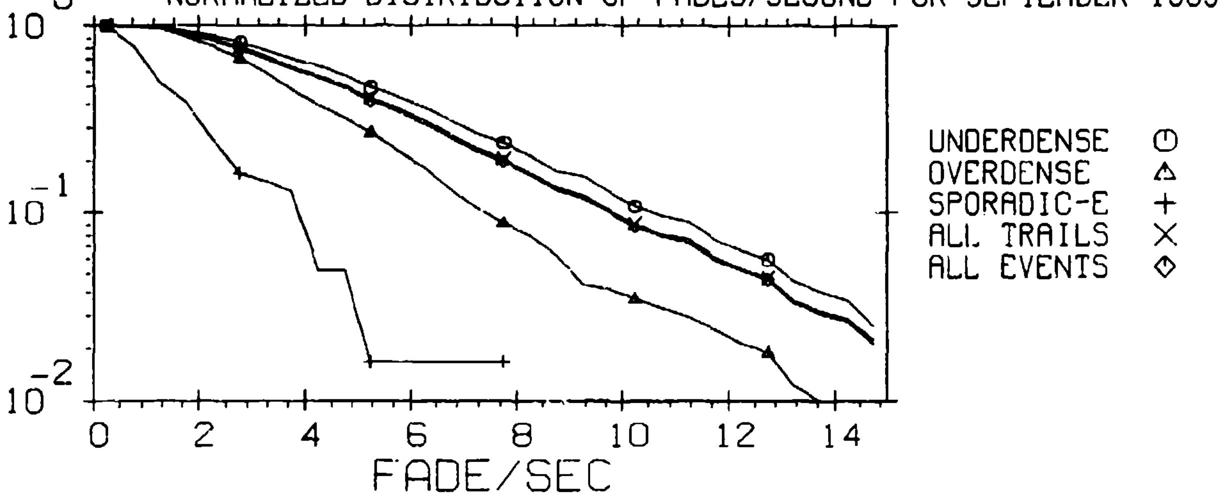
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 65 MHZ
NORMALIZING FACTORS:
UNDER : 2584. OVER : 969. SPOR-E : 15.
TRAILS : 3553. EVENTS : 3568.

MENU*109,02-4
14-JUN-93
PLOT* 103.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989

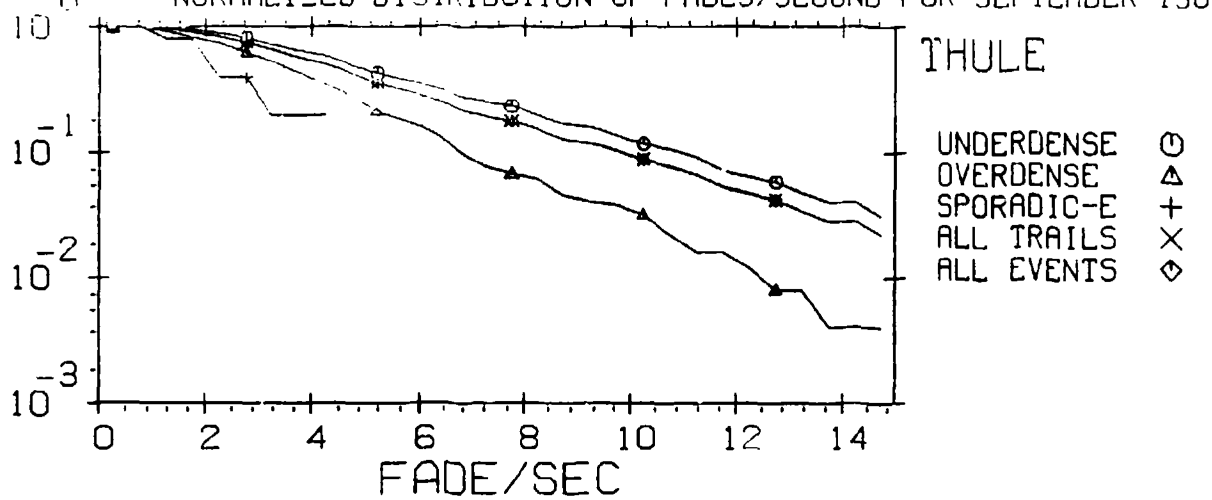



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 85 MHZ
NORMALIZING FACTORS:
UNDER : 1265. OVER : 509. SPOR-E : 61.
TRAILS : 1774. EVENTS : 1835.

MENU*109,02-4
14-JUN-93
PLOT* 104.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

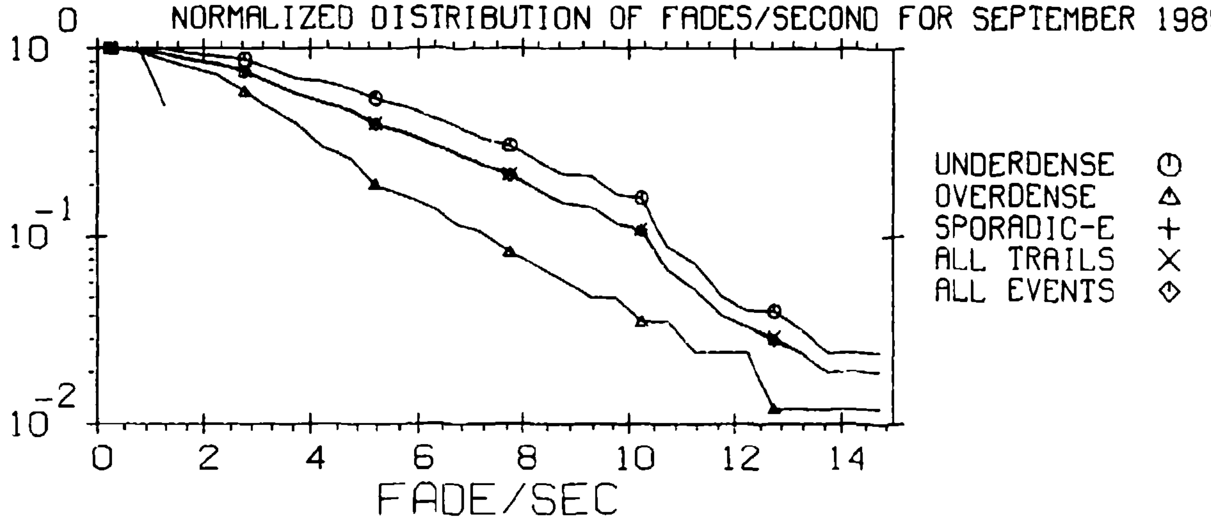
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 104 MHZ
NORMALIZING FACTORS:
UNDER : 1009. OVER : 503. SPOR-E : 5.
TRAILS : 1512. EVENTS : 1517.

MENU*109,02-4
14-JUN-93
PLOT* 105.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR SEPTEMBER 1989

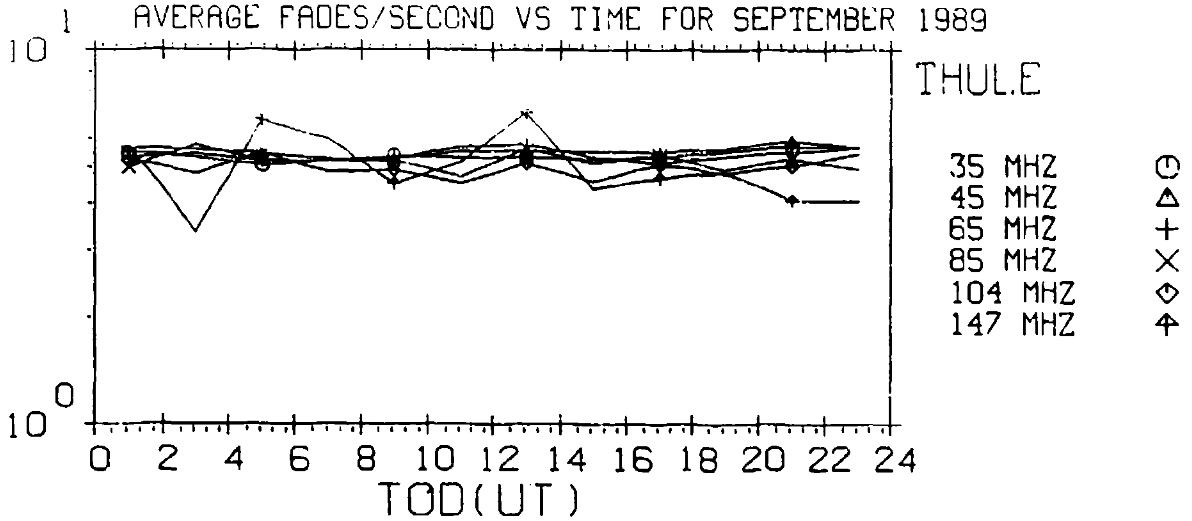



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 147 MHZ
NORMALIZING FACTORS:
UNDER : 125. OVER : 85. SPOR-E : 2.
TRAILS : 210. EVENTS : 212.

MENU*109,02-4
14-JUN-93
PLOT* 106.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

AVERAGE FADES/SECOND VS TIME FOR SEPTEMBER 1989

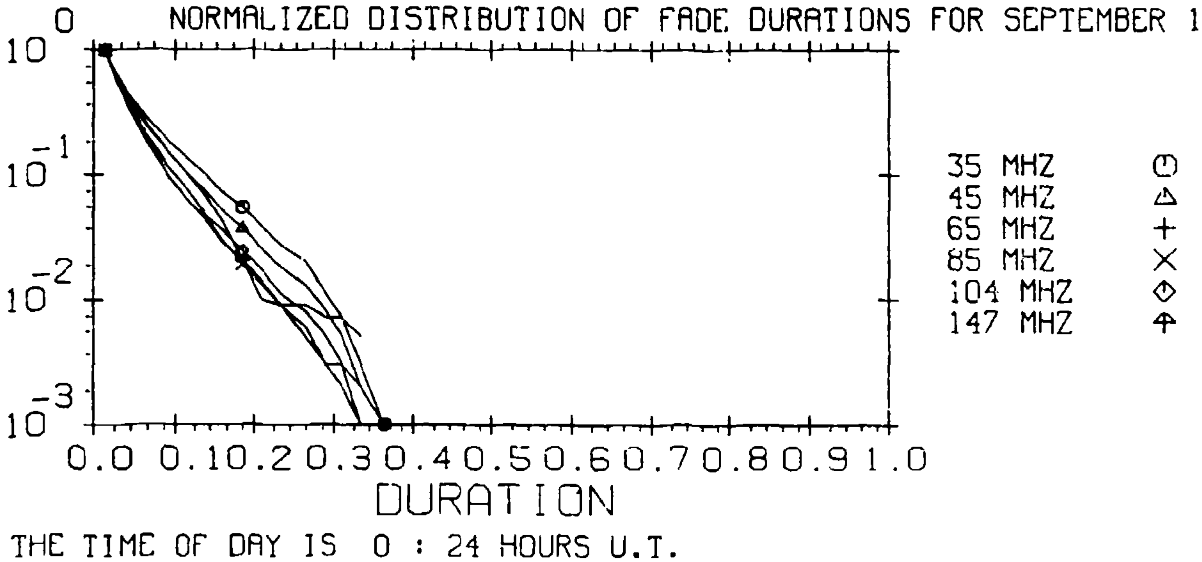



THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
THE 24 HOUR FADES/SECOND AVERAGES ARE:

| | | | | | |
|---|---|---|---|---|---|
| 5.204 | 5.343 | 5.240 | 5.058 | 4.842 | 4.967 |

MENU=109,07-1
14-JUN-93
PLOT= 107.00

NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989

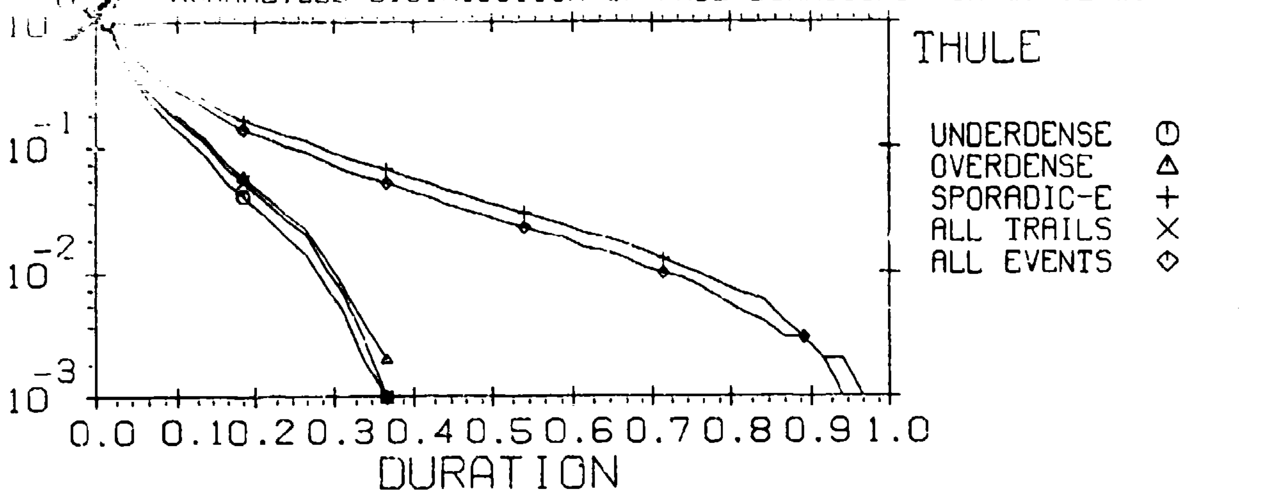



THE TIME OF DAY IS 0 : 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
NORMALIZING FACTORS:
35MHZ : 98779. 45MHZ : 73653. 65MHZ : 11781.
85MHZ : 5601. 104MHZ : 5036. 147MHZ : 367.

MENU=109,05-4
14-JUN-93
PLOT= 108.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

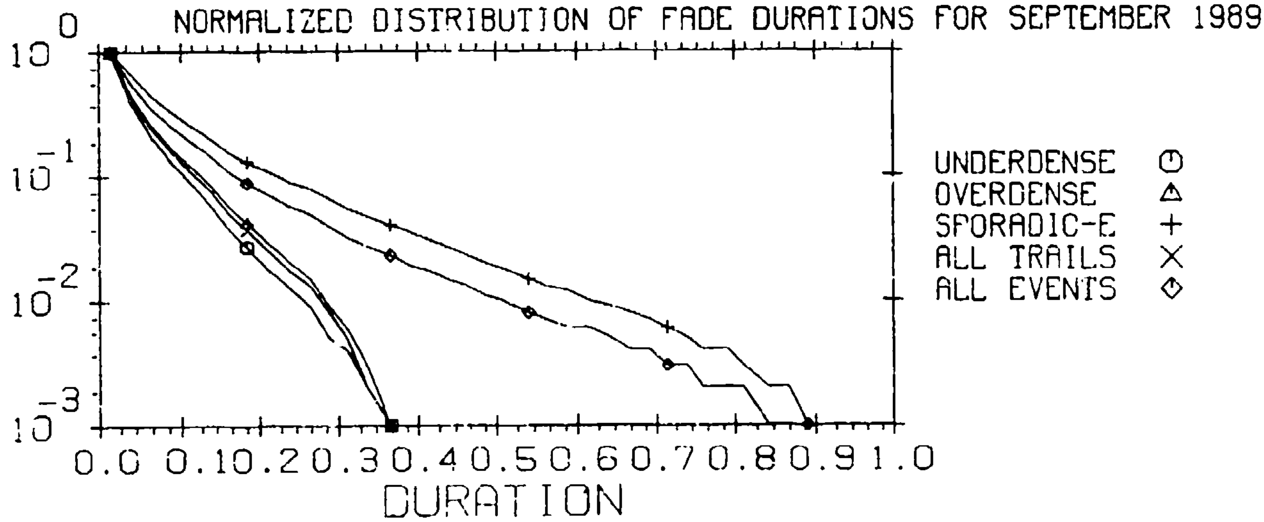
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 35 MHZ
NORMALIZING FACTORS:
UNDER : 28555. OVER : 70224. SPOR-E : 339859.
TRAILS : 98779. EVENTS : 438638.

MENU# 109,06-4
14-JUN-93
PLOT# 109.00

NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989

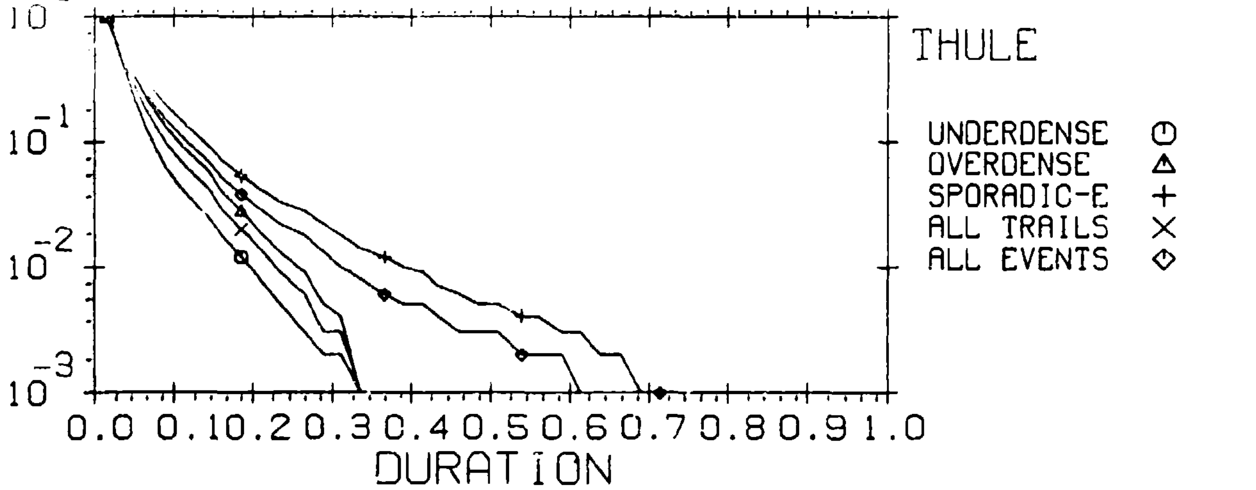



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 45 MHZ
NORMALIZING FACTORS:
UNDER : 25054. OVER : 48599. SPOR-E : 90339.
TRAILS : 73653. EVENTS : 163992.

MENU# 109,06-4
14-JUN-93
PLOT# 110.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

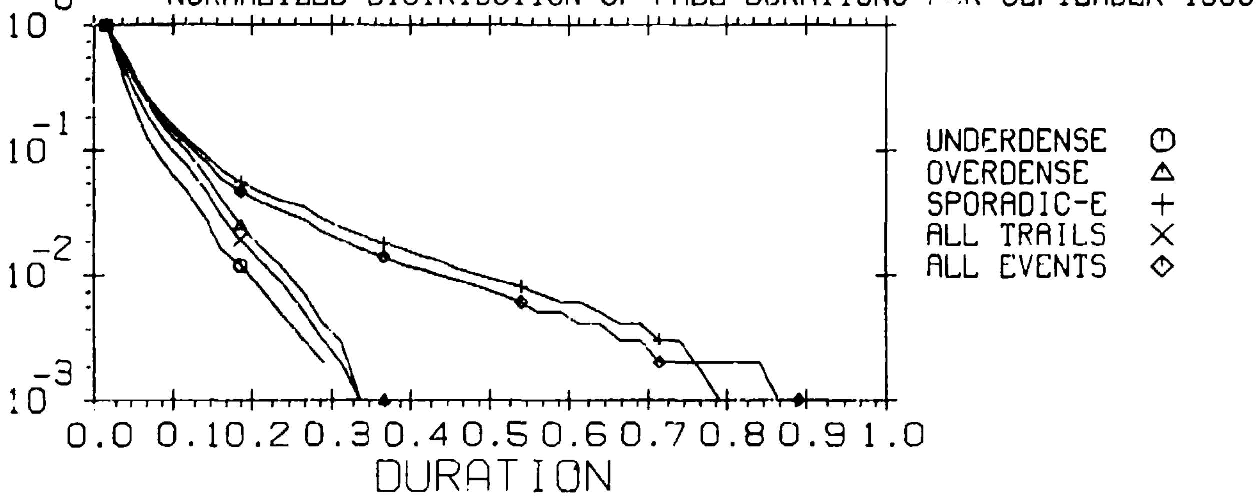
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 65 MHZ
NORMALIZING FACTORS:
UNDER : 5633. OVER : 6148. SPOR-E : 12942.
TRAILS : 11781. EVENTS : 24723.

MENU*109,06-4
14-JUN-93
PLOT* 111.00

NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989

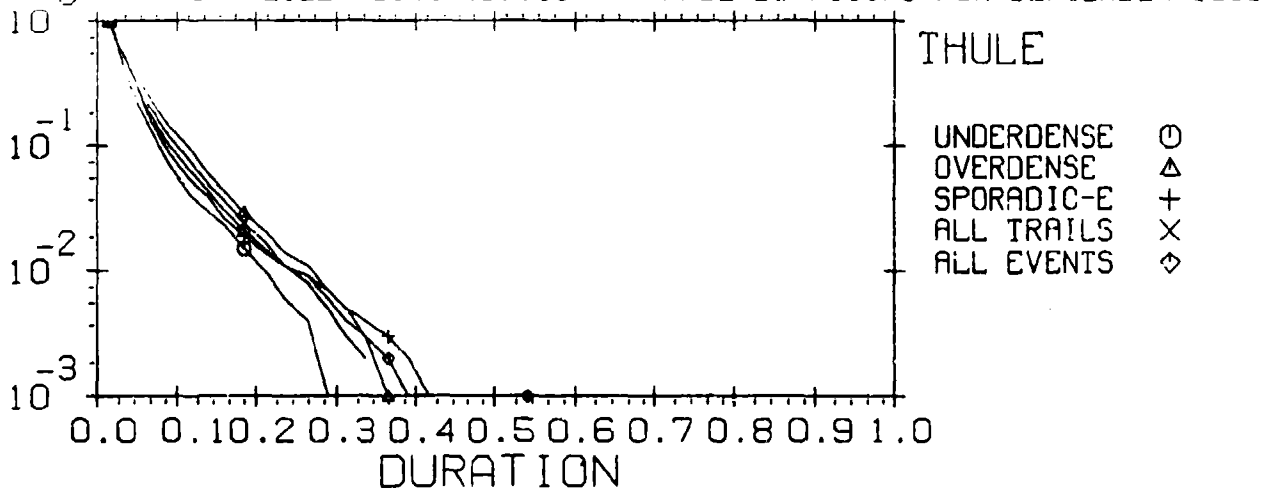



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 85 MHZ
NORMALIZING FACTORS:
UNDER : 2477. OVER : 3124. SPOR-E : 17855.
TRAILS : 5601. EVENTS : 23456.

MENU*109,06-4
14-JUN-93
PLOT* 112.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

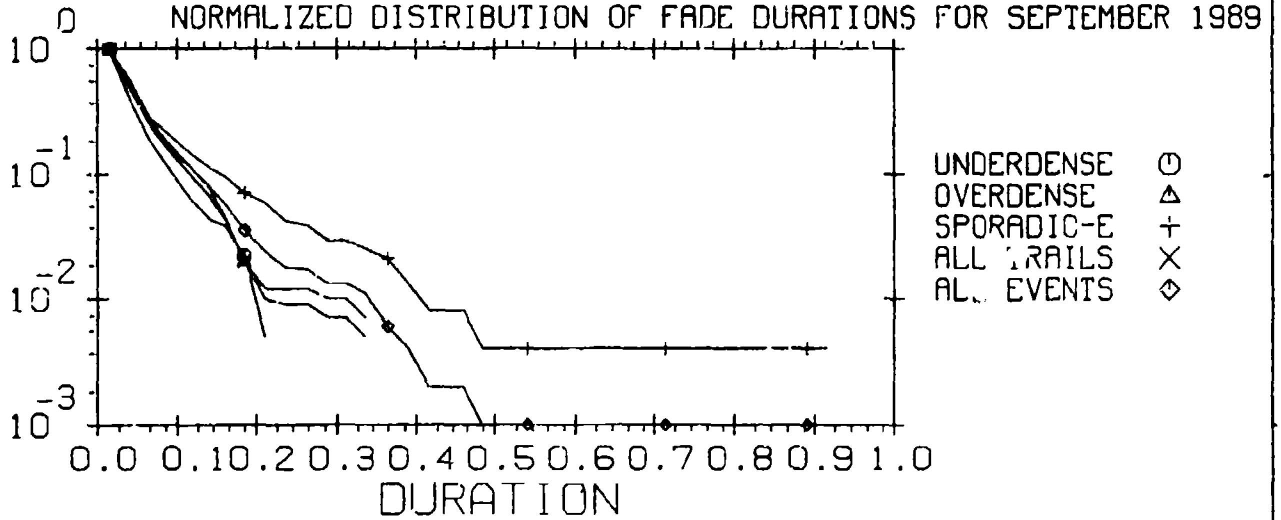
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 104 MHZ
NORMALIZING FACTORS:
UNDER : 1769. OVER : 3267. SPOR-E : 6541.
TRAILS : 5036. EVENTS : 11577.

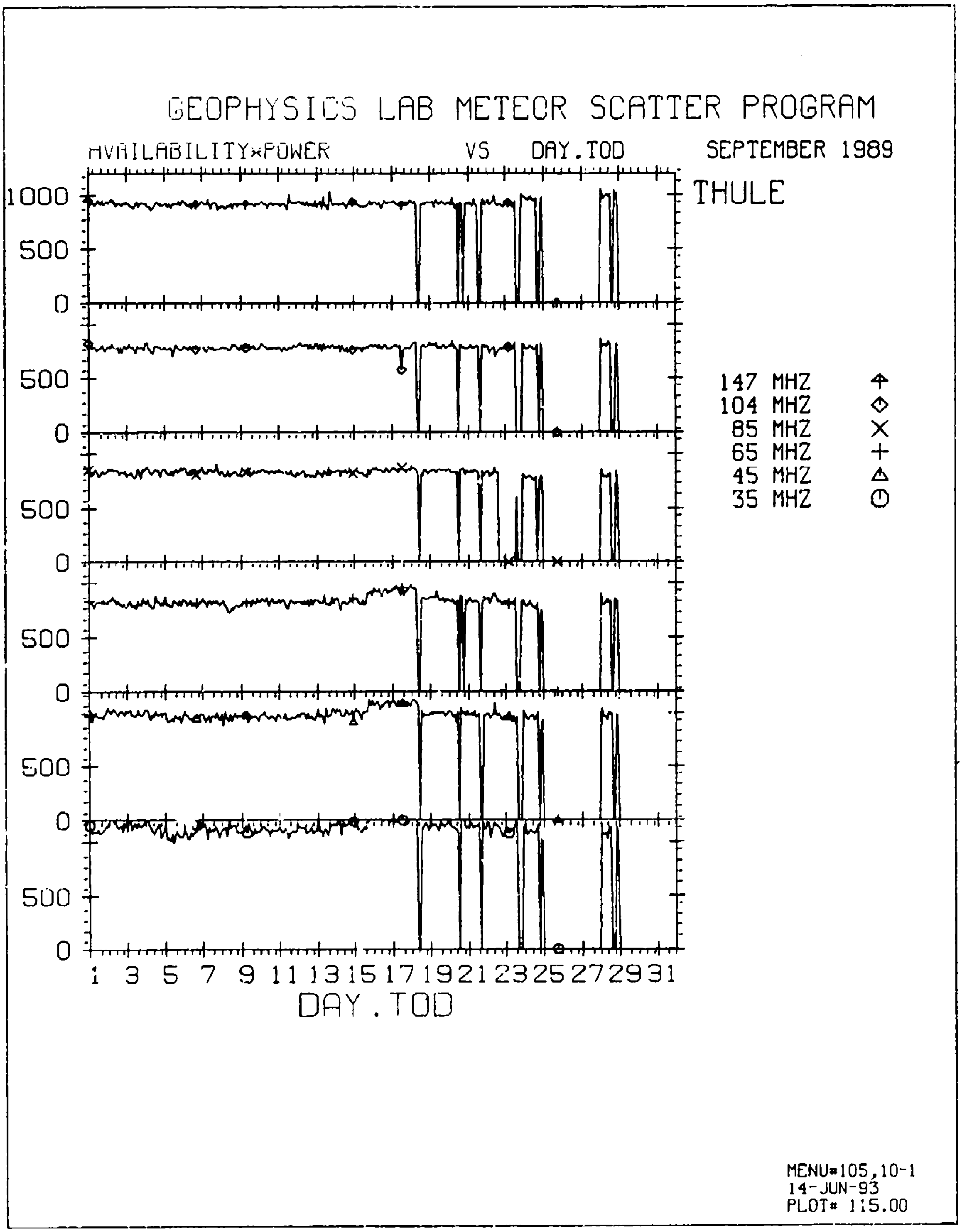
MENU*109,06-4
14-JUN-93
PLOT* 113.00

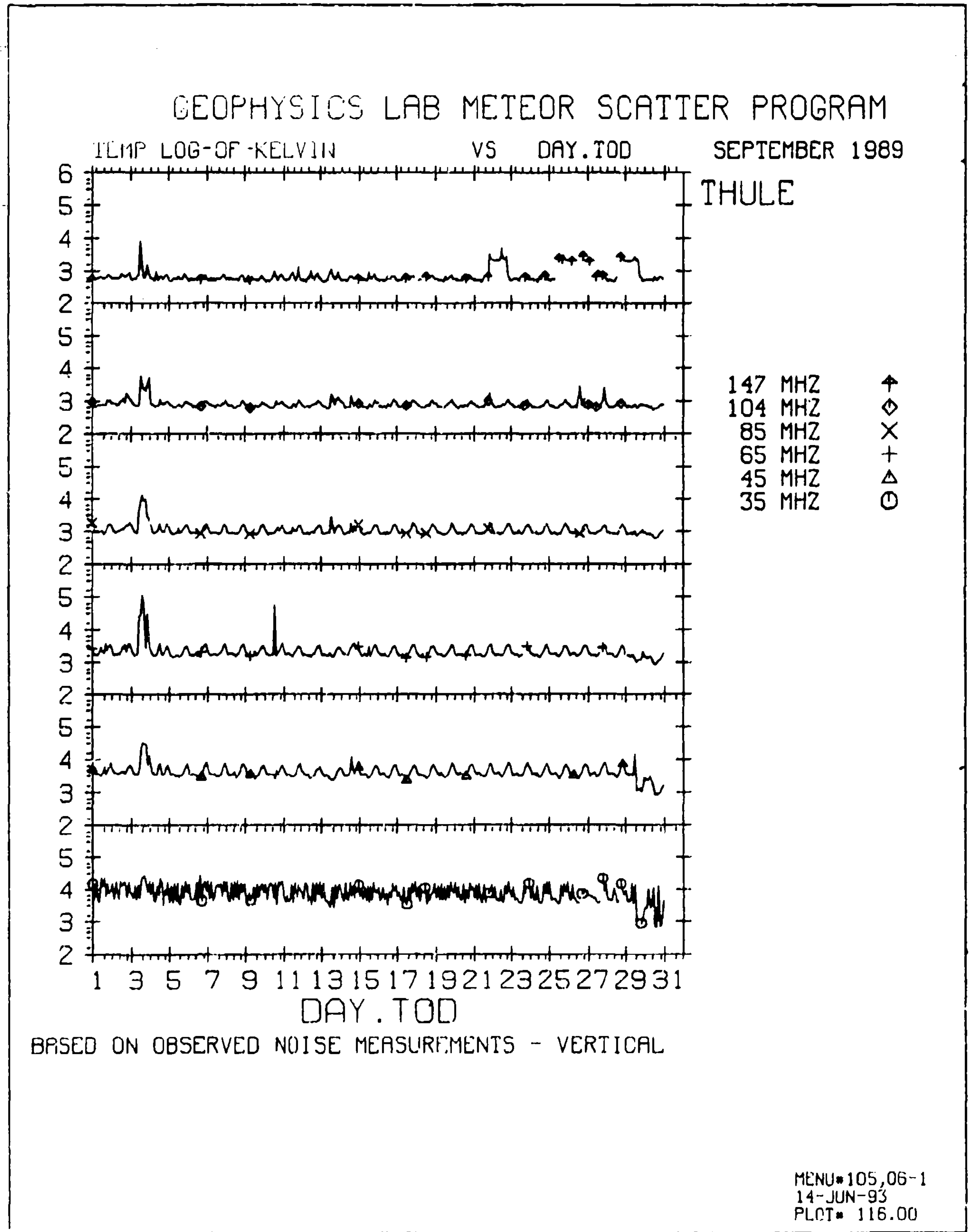
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR SEPTEMBER 1989

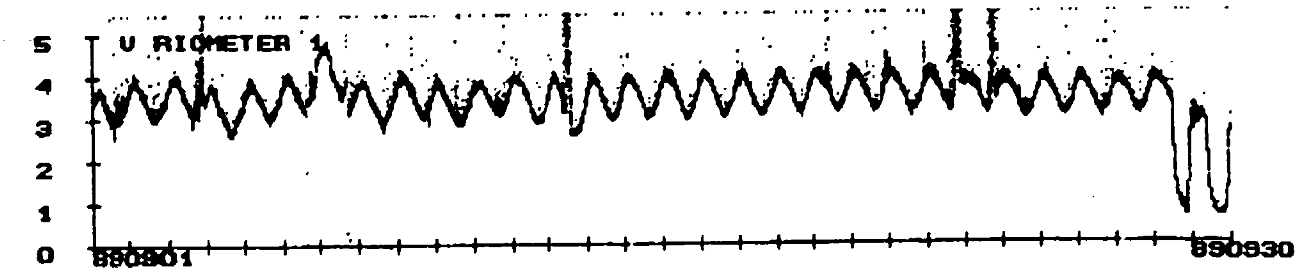



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 147 MHZ
NORMALIZING FACTORS:
UNDER : 185. OVER : 402. SPOR-E : 238.
TRAILS : 587. EVENTS : 825.

MENU*109,06-4
14-JUN-93
PLOT* 114.00


GEOPHYSICS LAB METEOR SCATTER PROGRAM
AVAILABILITY×POWER VS DAY.TOD
SEPTEMBER 1989
THULE
1000
500
0
147 MHZ
104 MHZ
85 MHZ
65 MHZ
45 MHZ
35 MHZ
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
DAY.TOD
MENU#105,10-1
14-JUN-93
PLOT# 115.00


GEOPHYSICS LAB METEOR SCATTER PROGRAM
TEMP LOG-OF-KELVIN VS DAY.TOD
SEPTEMBER 1989
THULE
147 MHZ
104 MHZ
85 MHZ
65 MHZ
45 MHZ
35 MHZ
6
5
4
3
2
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
DAY.TOD
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
MENU* 105,06-1
14-JUN-93
PLOT* 116.00



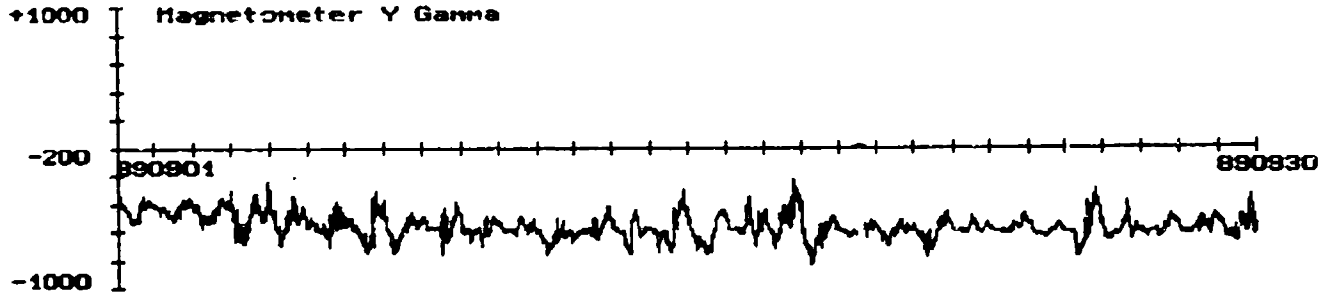

PLOT 117

PLOT 118 RIOMETER 2 DATA UNAVAILABLE

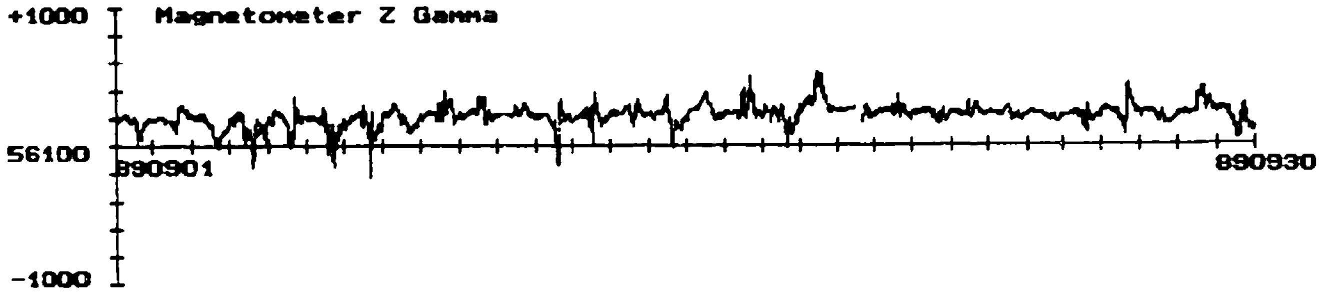

PLOT 119

PLOT 120 RIOMETER 2 DATA UNAVAILABLE


PLOT 121




PLOT 122

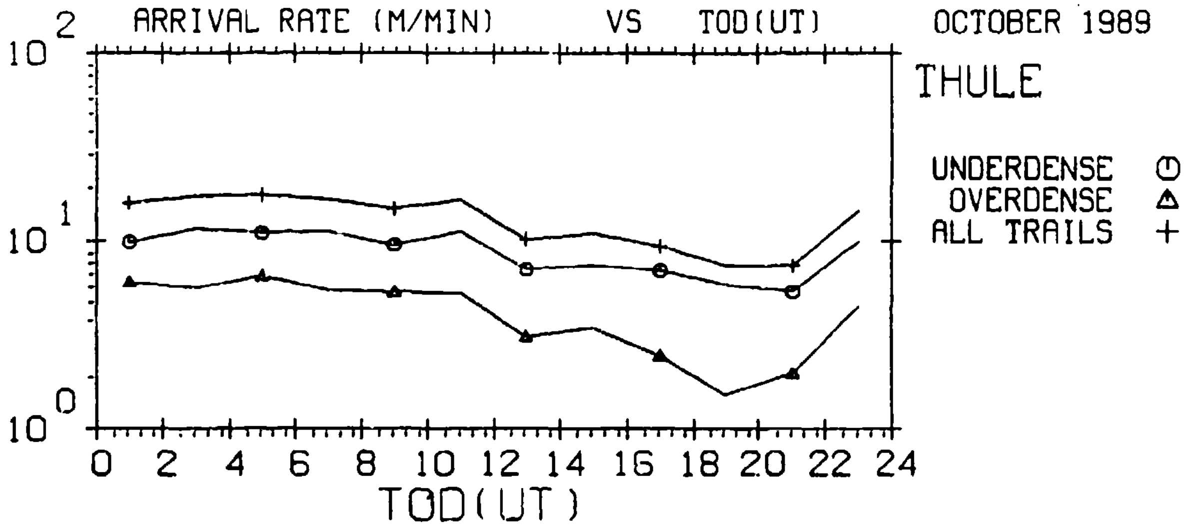



PLOT 123

# APPENDIX C

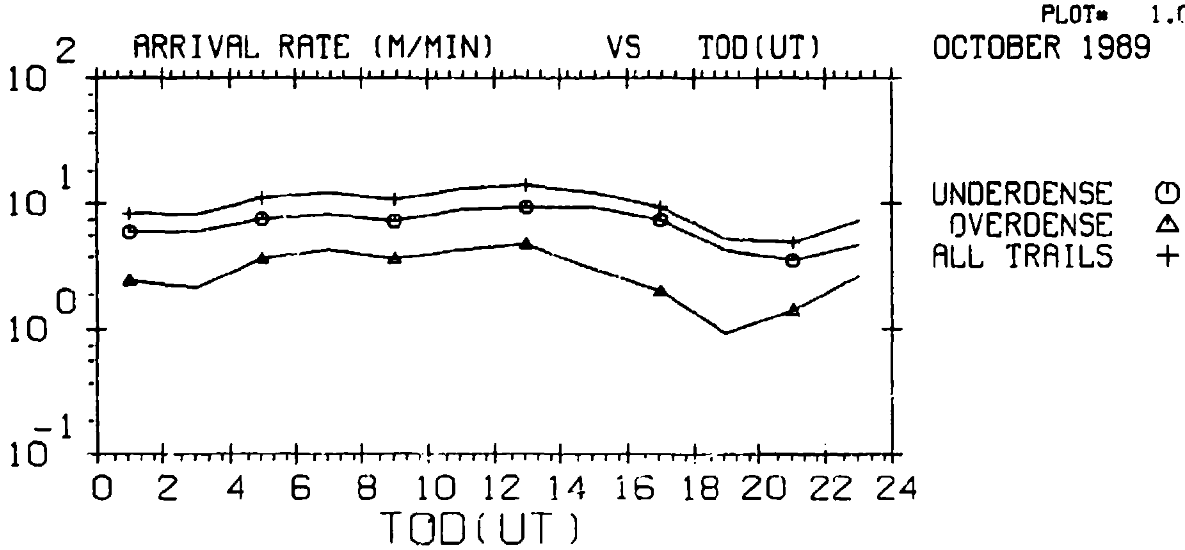
## STATISTICS FOR OCTOBER 1989

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MA..MUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

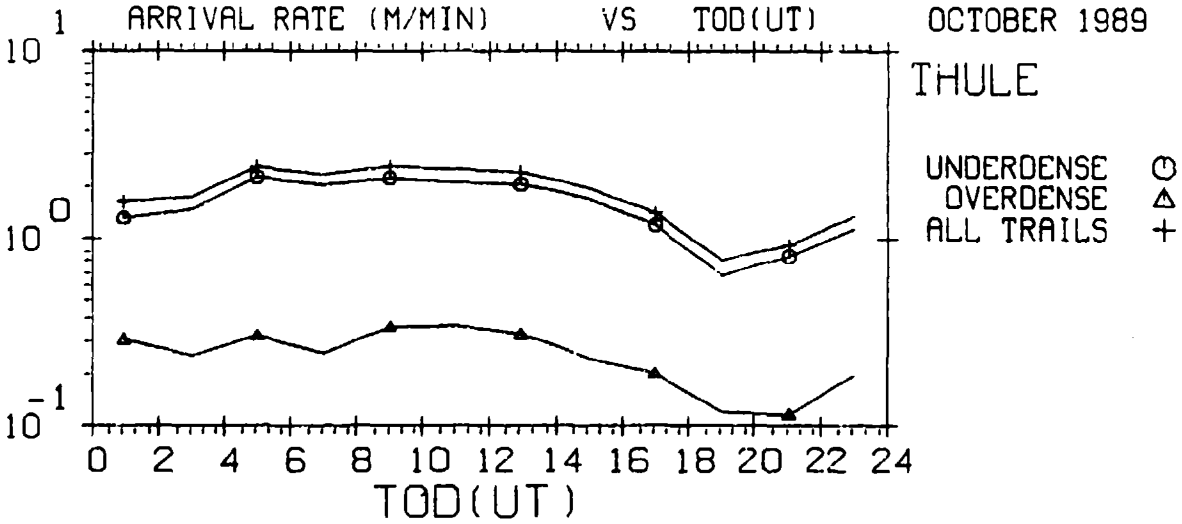
MENU*101,05-2
13-MAY-93
PLOT* 1.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

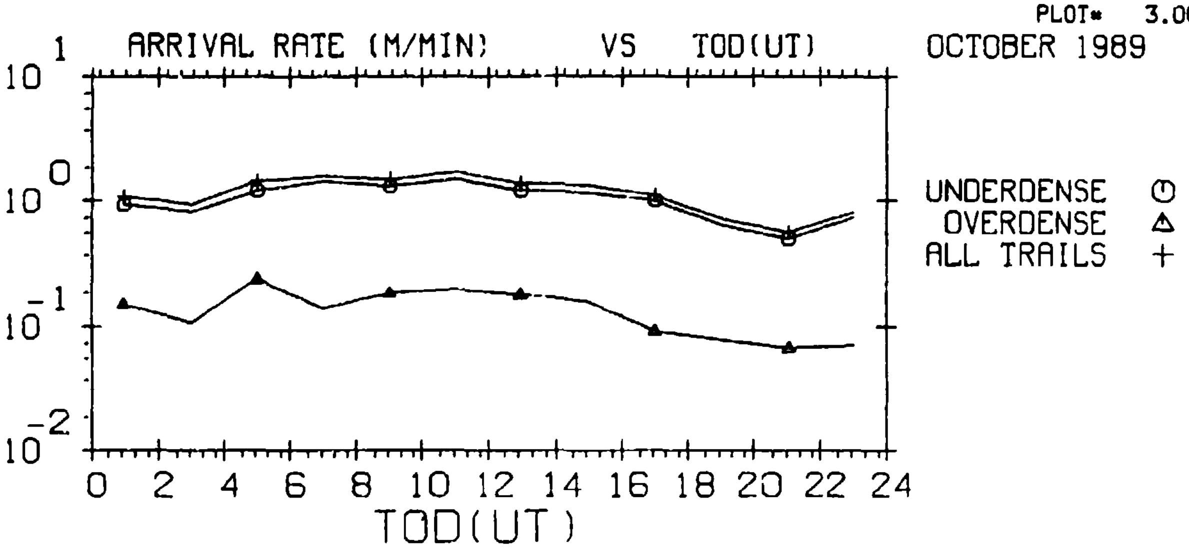
MENU*101,05-2
13-MAY-93
PLOT* 2.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

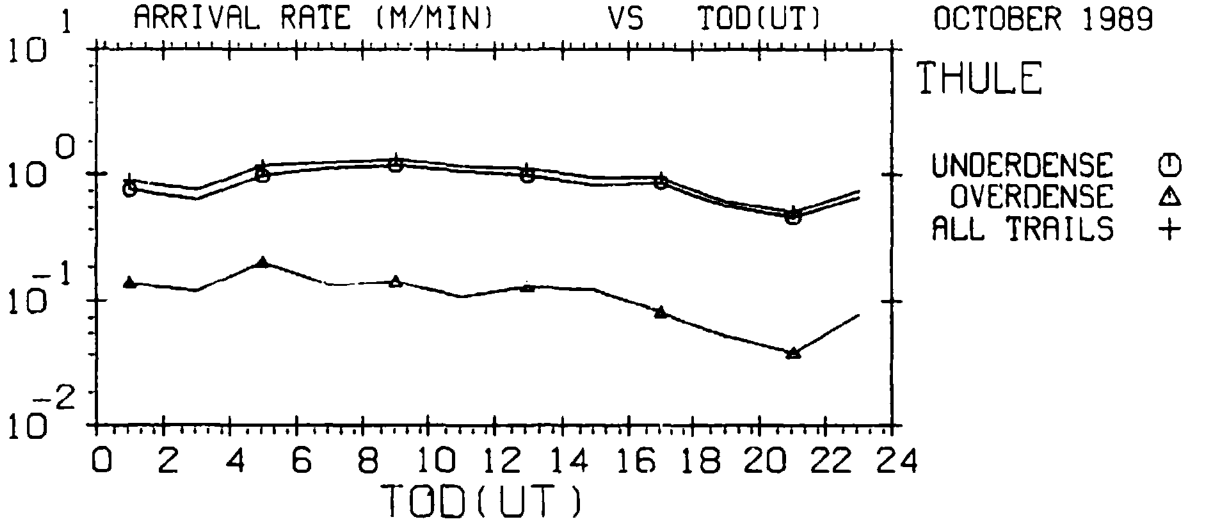
MENU*101,05-2
13-MAY-93
PLOT* 3.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

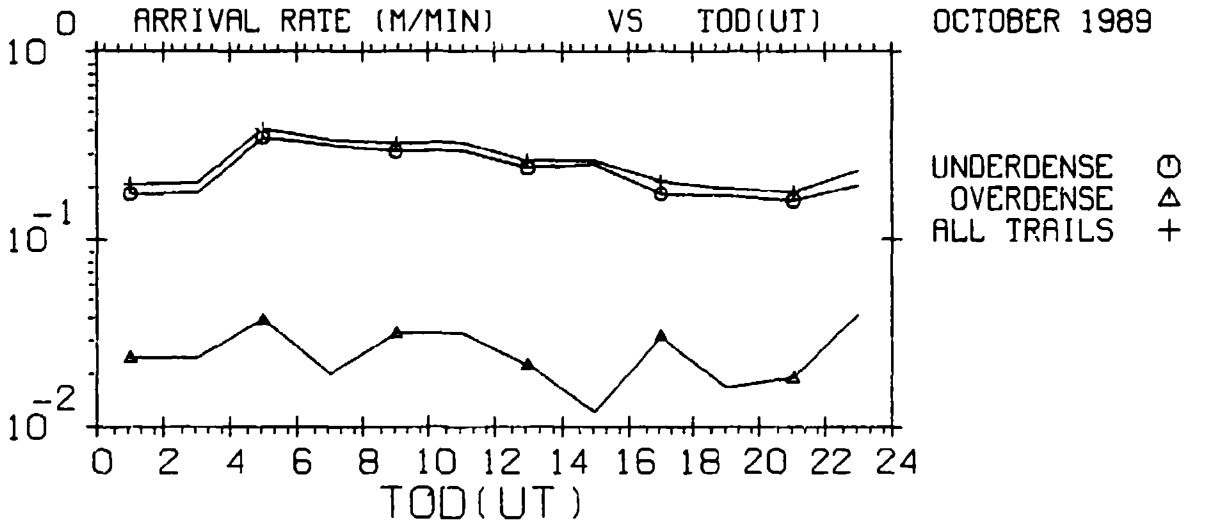
MENU*101,05-2
13-MAY-93
PLOT* 4.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

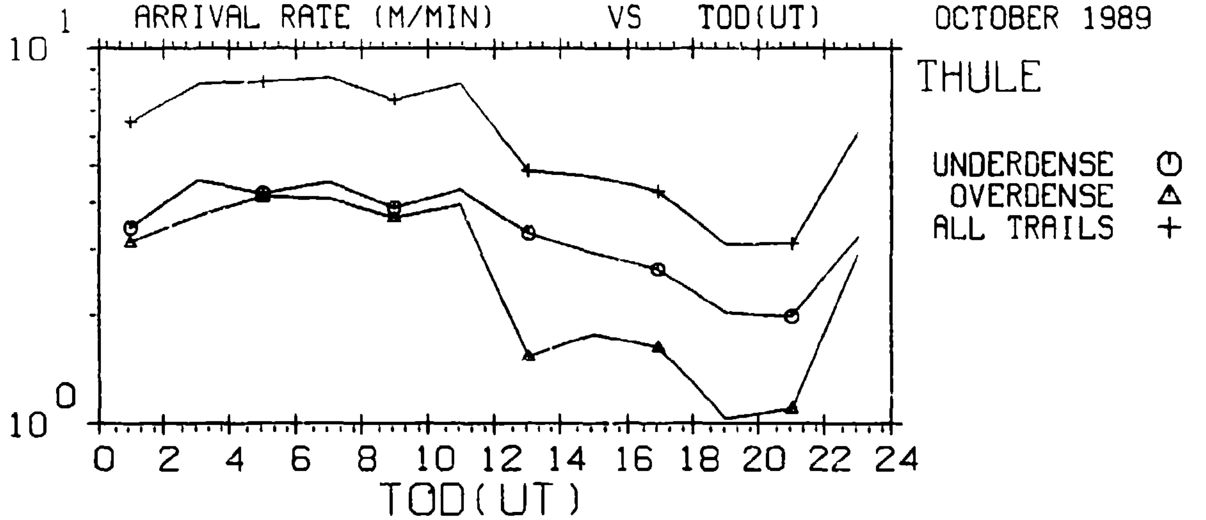
MENU#101,05-2
13-MAY-93
PLOT# 5.00




EXCEEDING -126.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

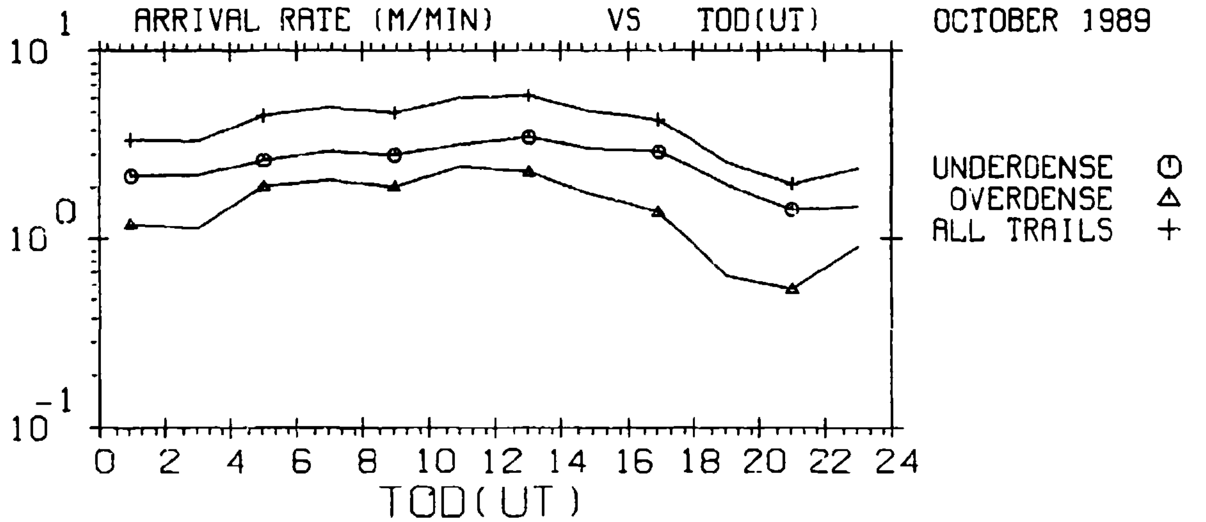
MENU#101,05-2
13-MAY-93
PLOT# 6.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

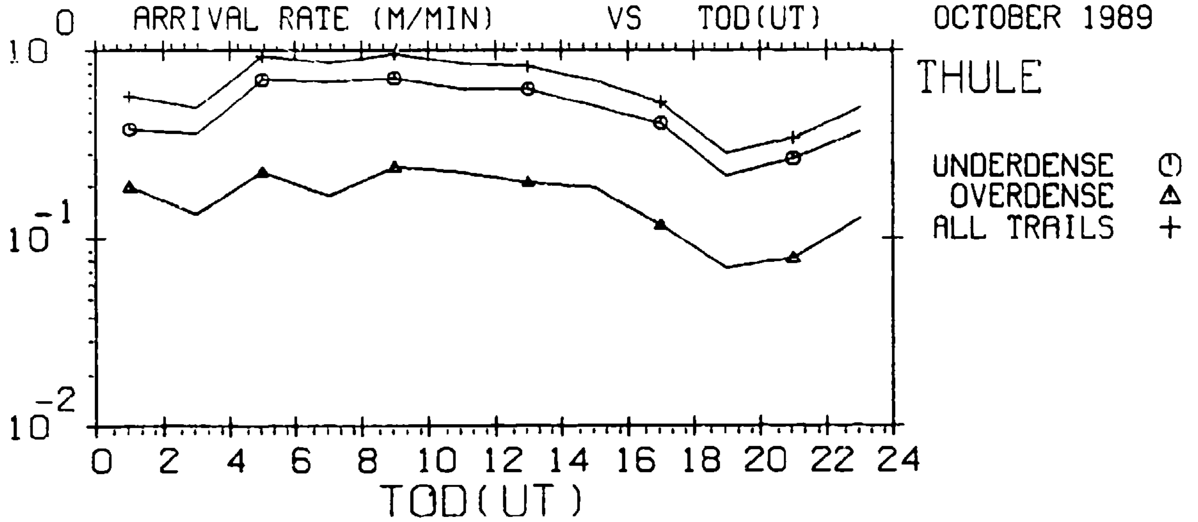
MENU=101,05-2
13-MAY-93
PLOT= 7.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

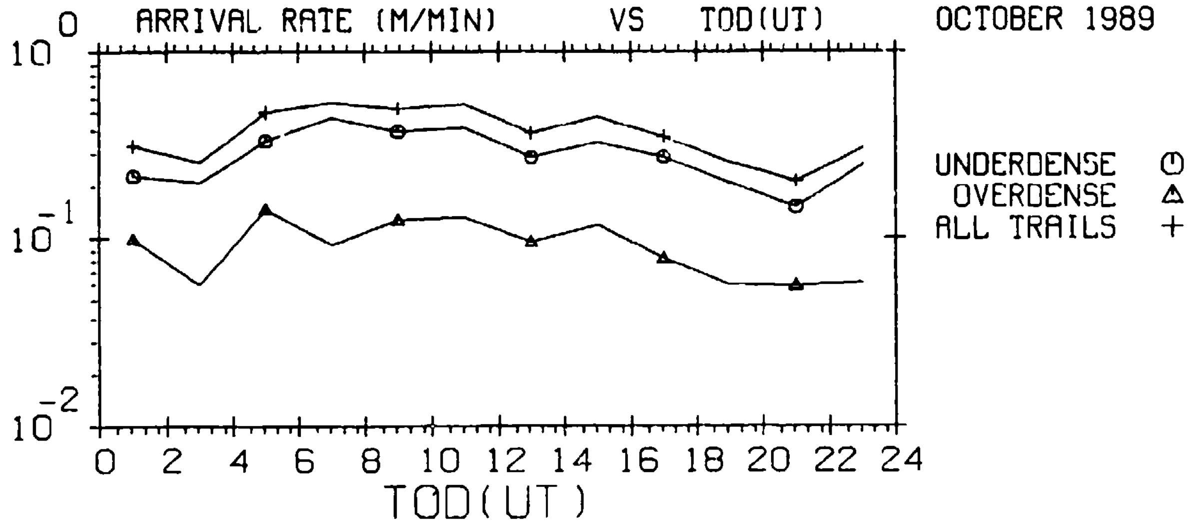
MENU=101,05-2
13-MAY-93
PLOT= 8.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

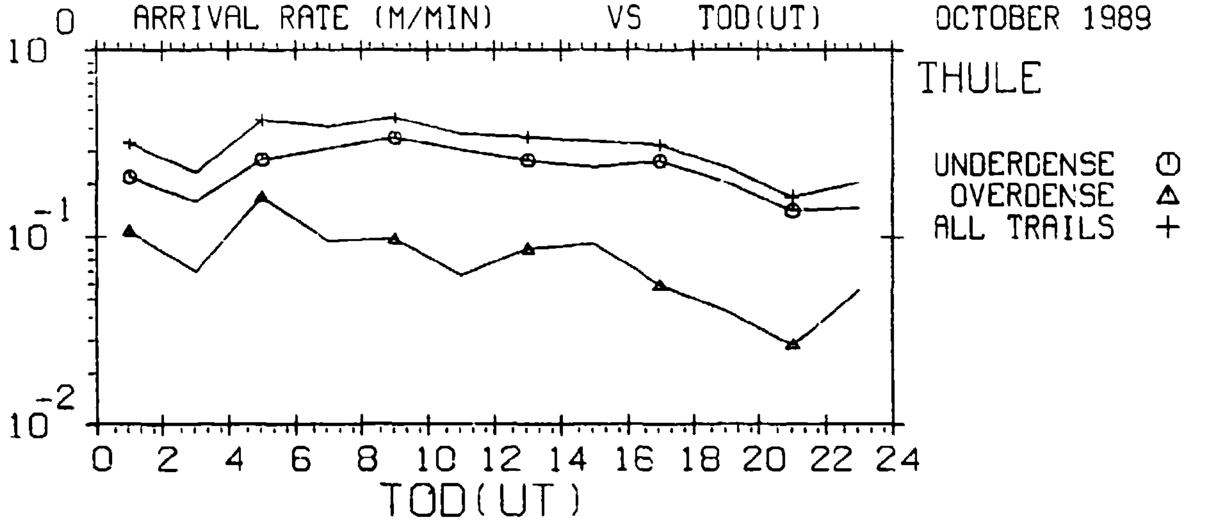
MENU*101,05-2
13-MAY-93
PLOT* 9.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

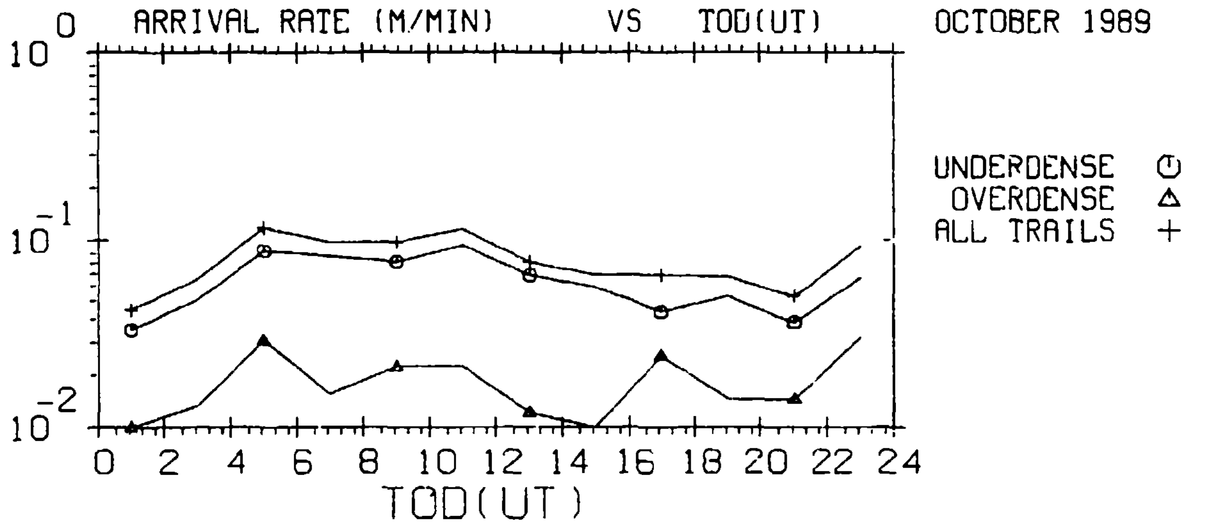
MENU*101,05-2
13-MAY-93
PLOT* 10.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

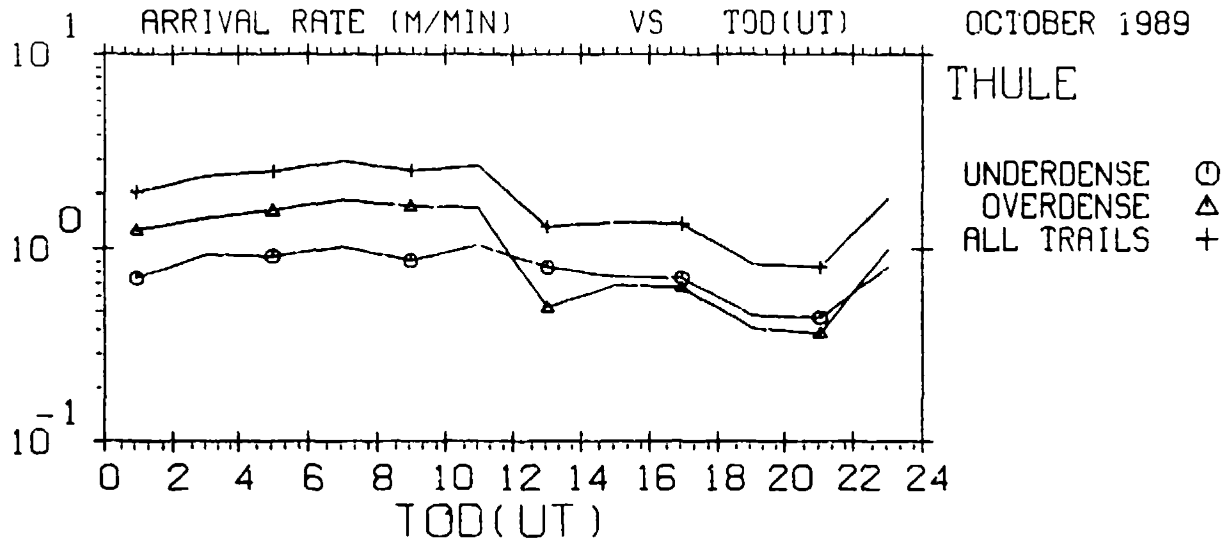
MENU#101,05-2
13-MAY-93
PLOT# 11.00




EXCEEDING -116.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

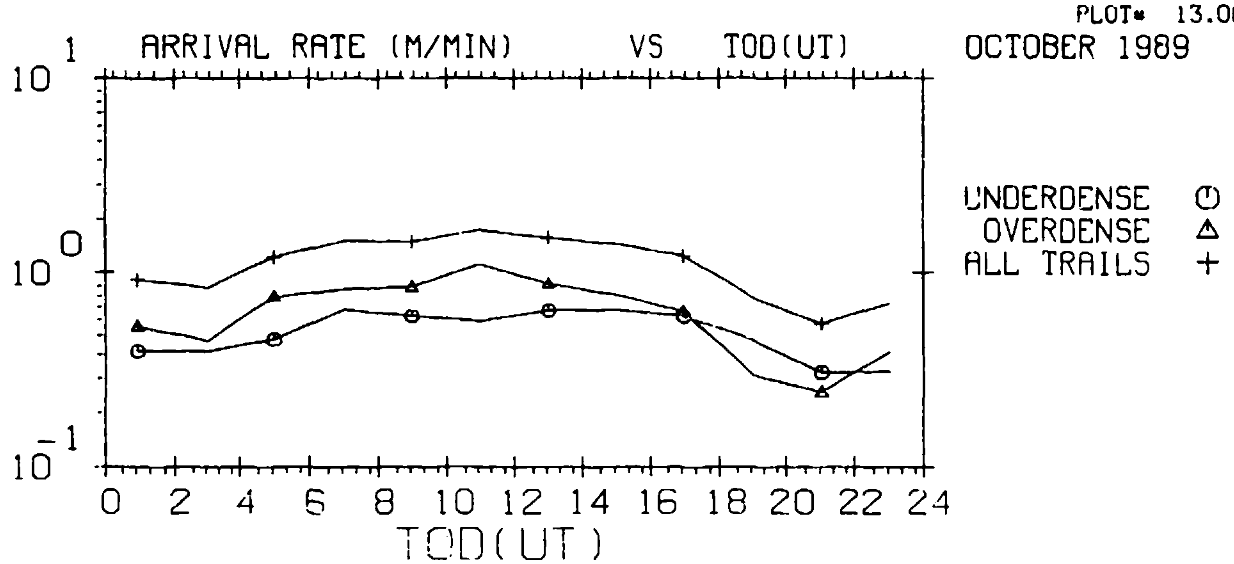
MENU#101,05-2
13-MAY-93
PLOT# 12.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

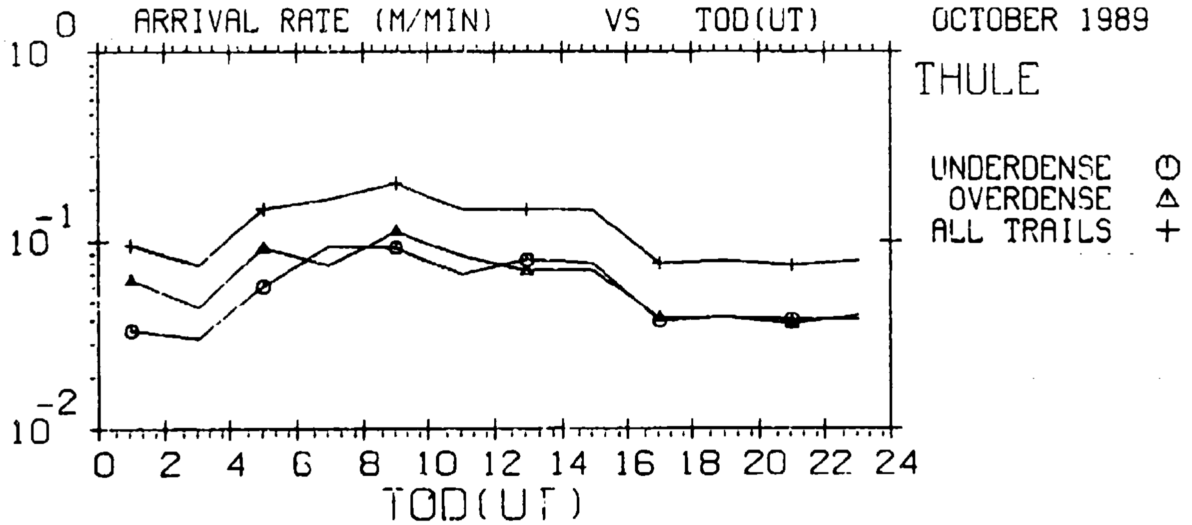
MENU#101,05-2
13-MAY-93
PLOT# 13.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

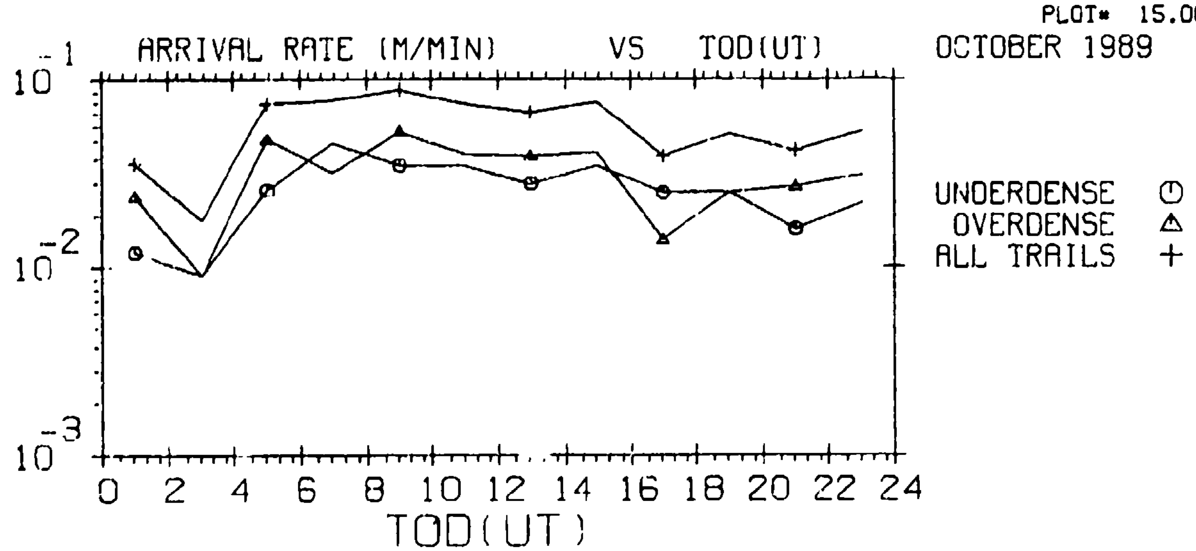
MENU#101,05-2
13-MAY-93
PLOT# 14.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

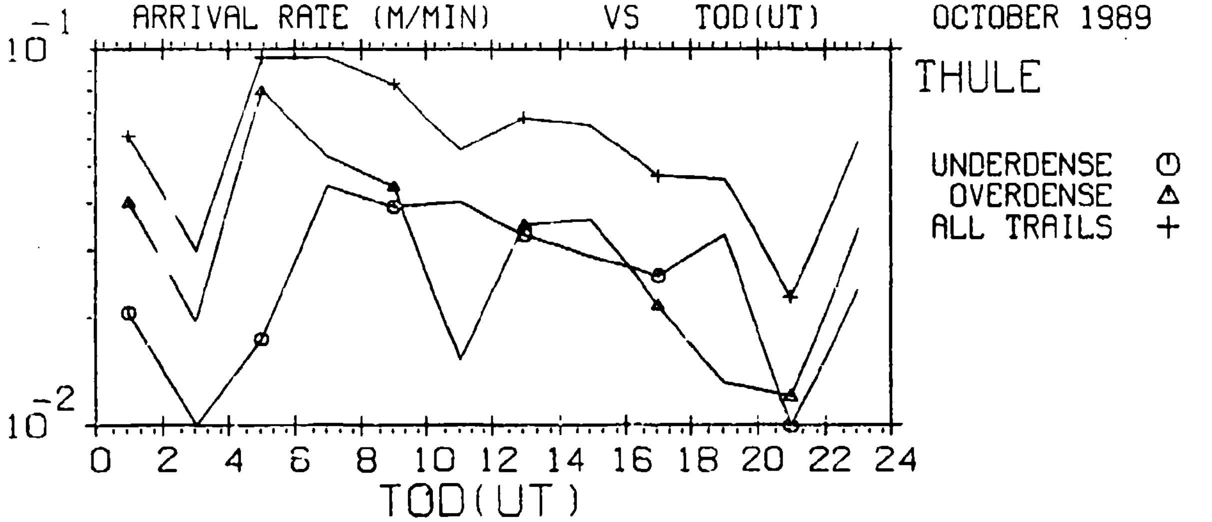
MENU*101,05-2
13-MAY-93
PLOT* 15.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

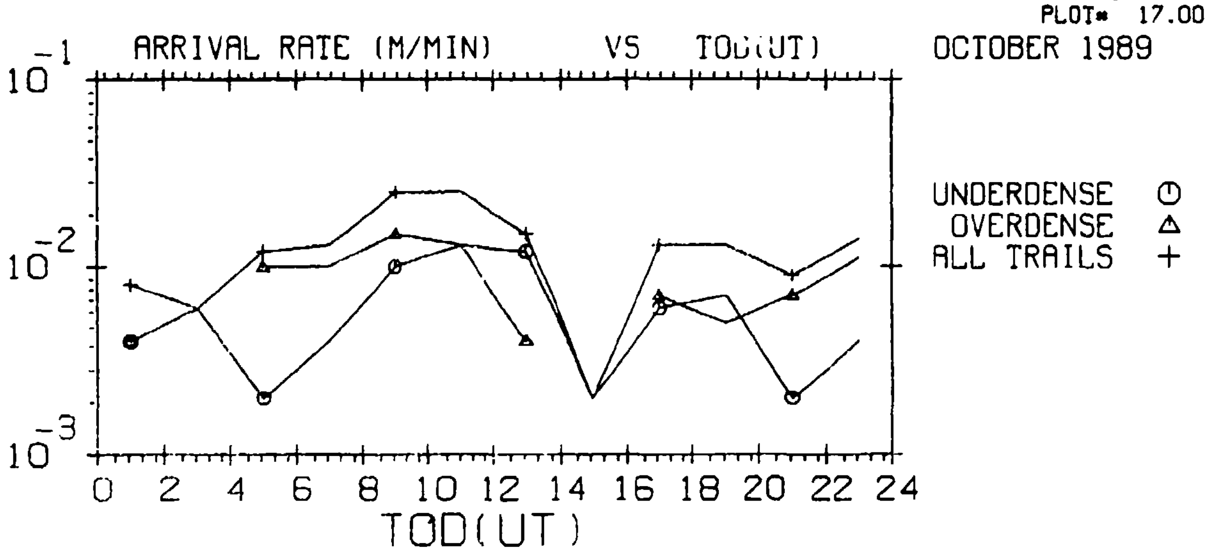
MENU*101,05-2
13-MAY-93
PLOT* 16.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

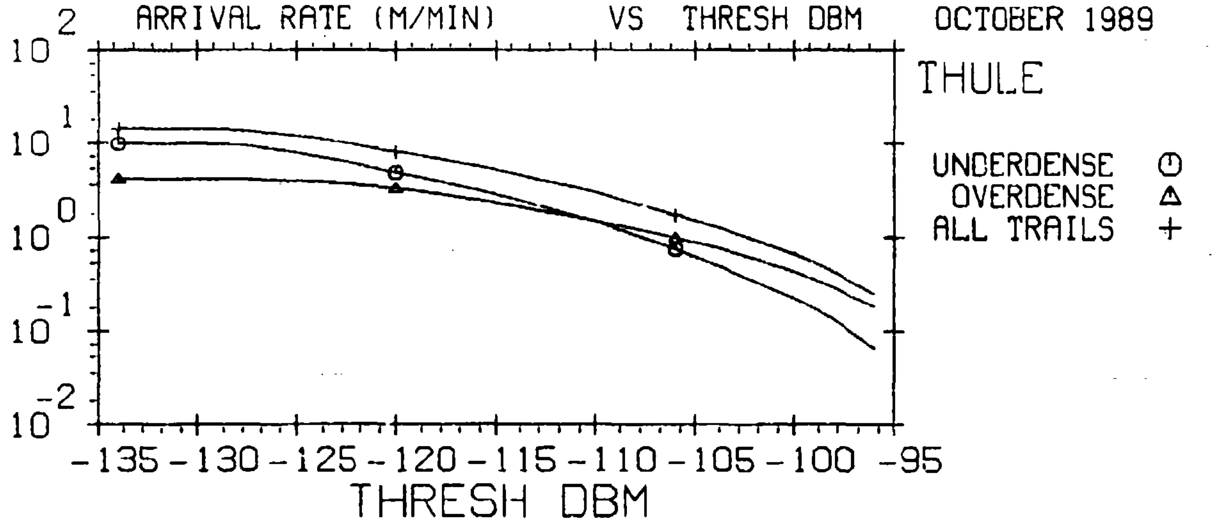
MENU*101,05-2
13-MAY-93
PLOT* 17.00




EXCEEDING -106.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

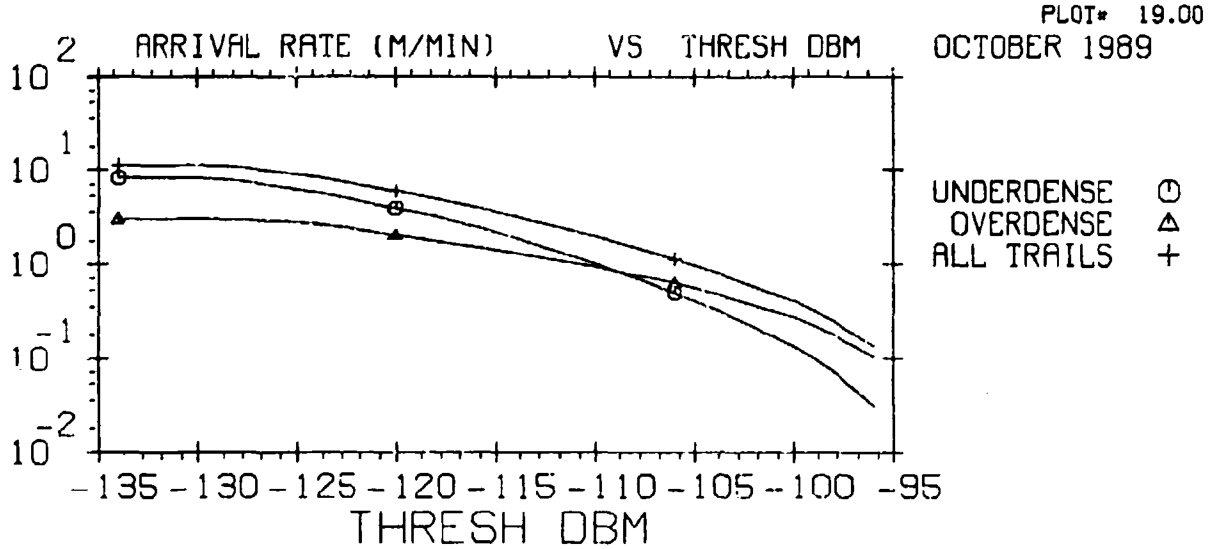
MENU*101,05-2
13-MAY-93
PLOT* 18.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

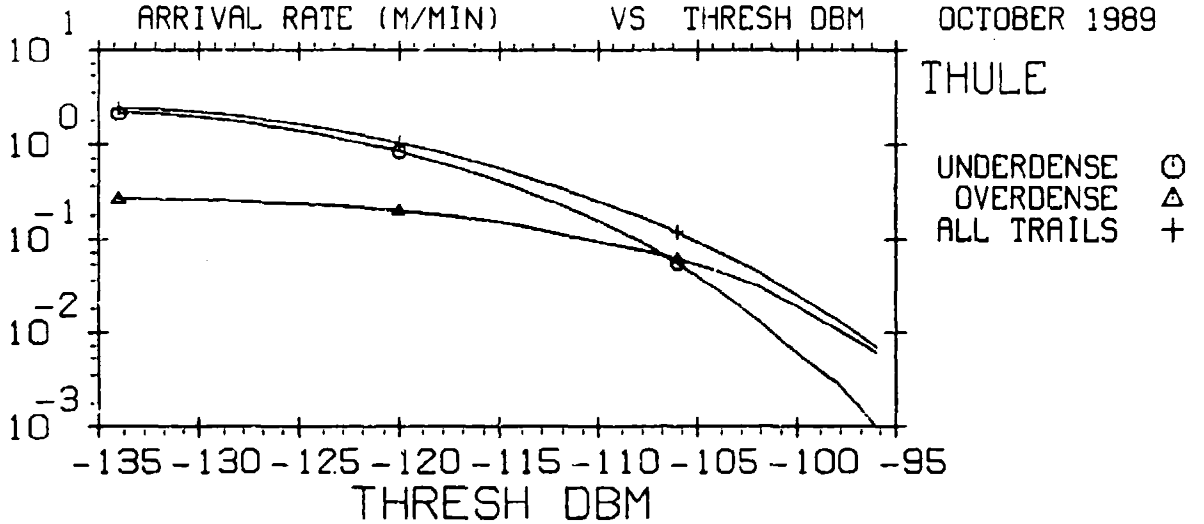
MENU*101,06-2
13-MAY-93
PLOT* 19.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E = 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

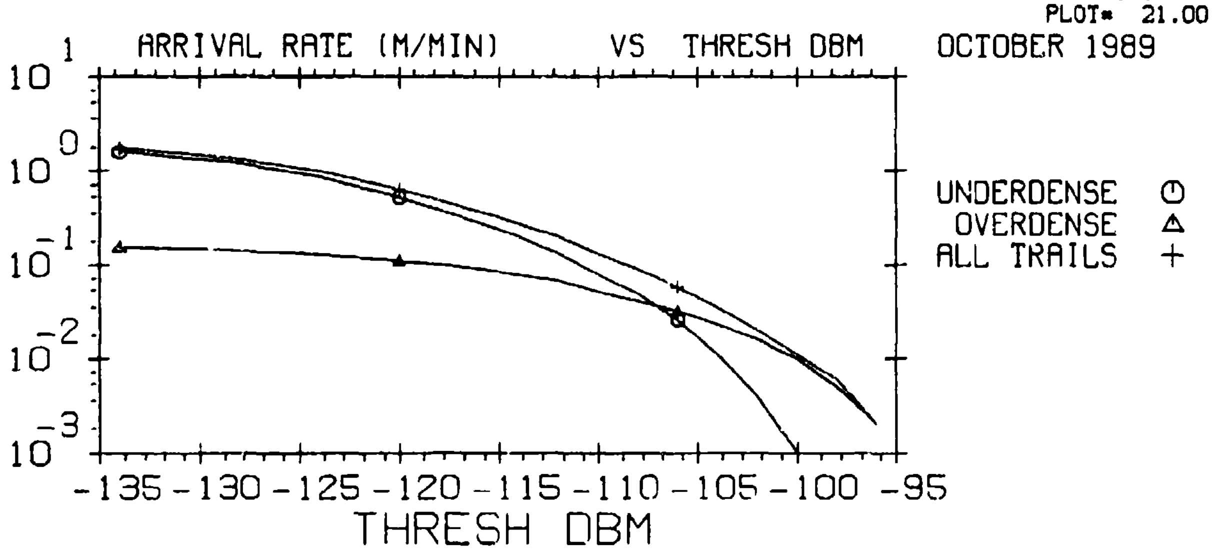
MENU*101,06-2
13-MAY-93
PLOT* 20.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

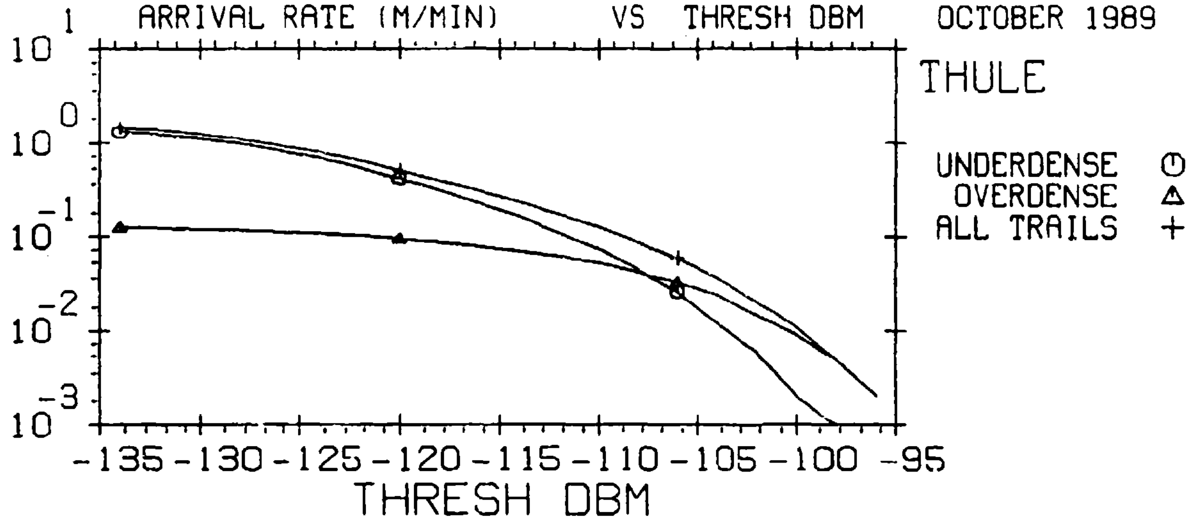
MENU#101,06-2
13-MAY-93
PLOT# 21.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

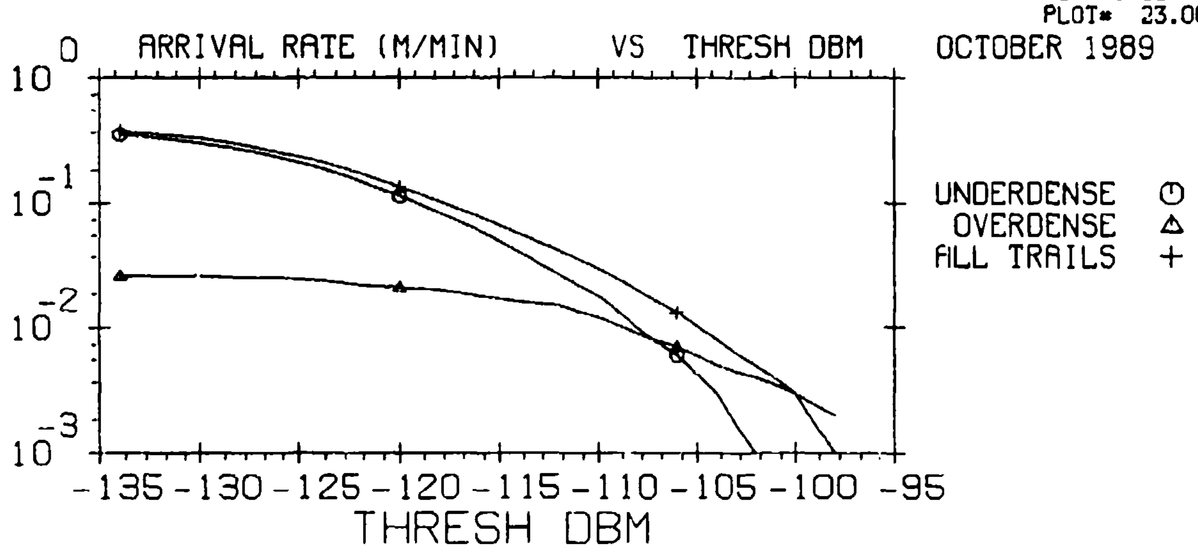
MENU#101,06-2
13-MAY-93
PLOT# 22.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

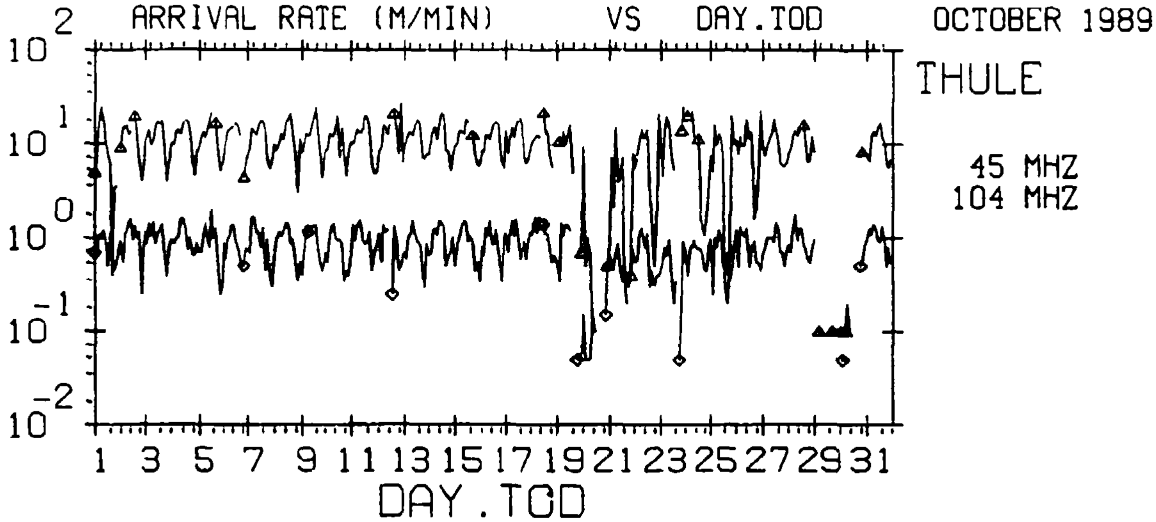
MENU*101,06-2
13-MAY-93
PLOT* 23.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

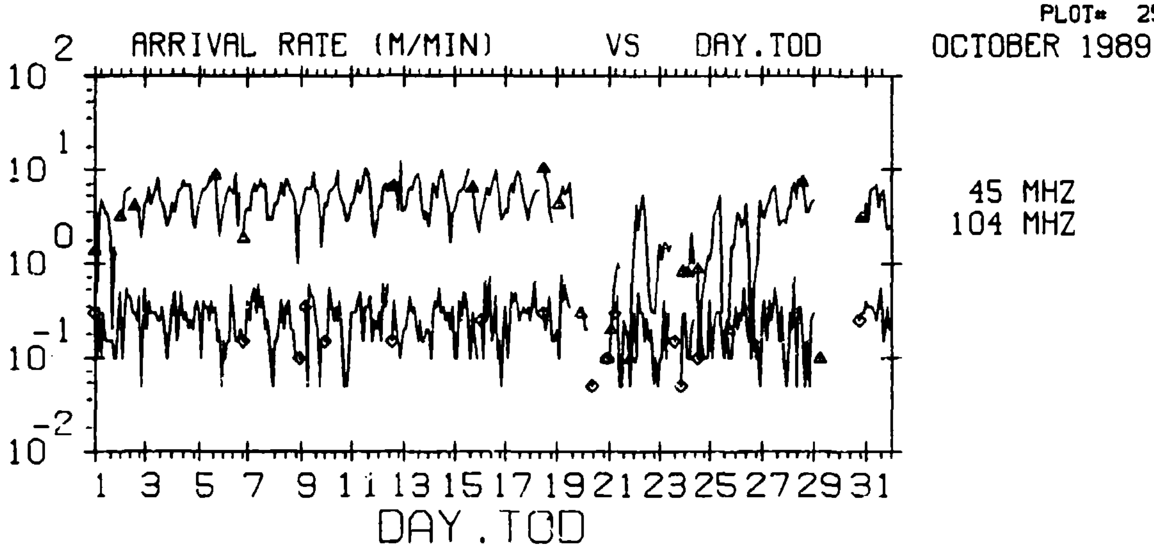
MENU*101,06-2
13-MAY-93
PLOT* 24.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

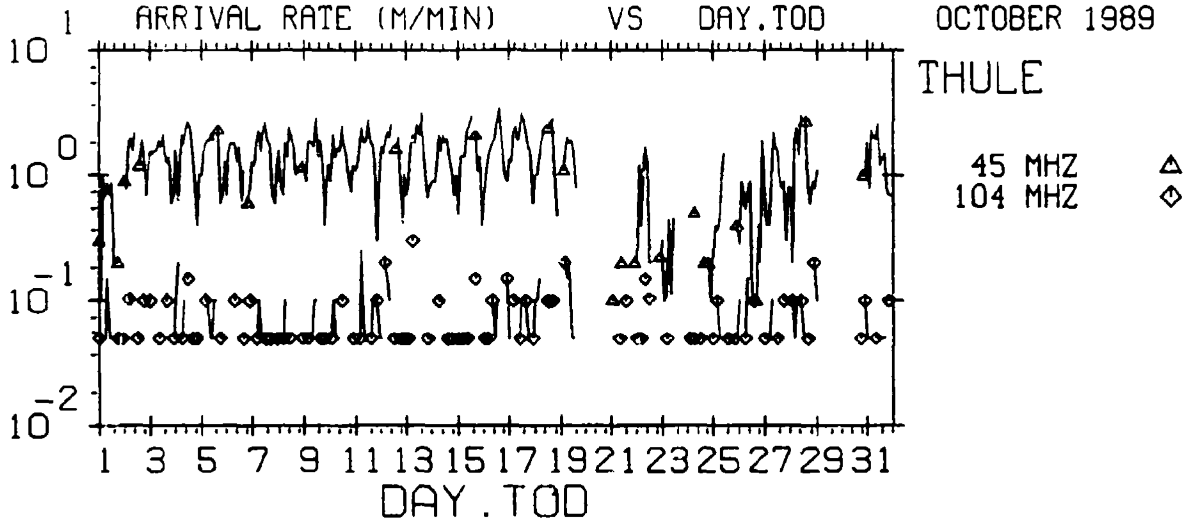
MENU*101,03-2
13-MAY-93
PLOT* 25.00




EXCEEDING -116.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

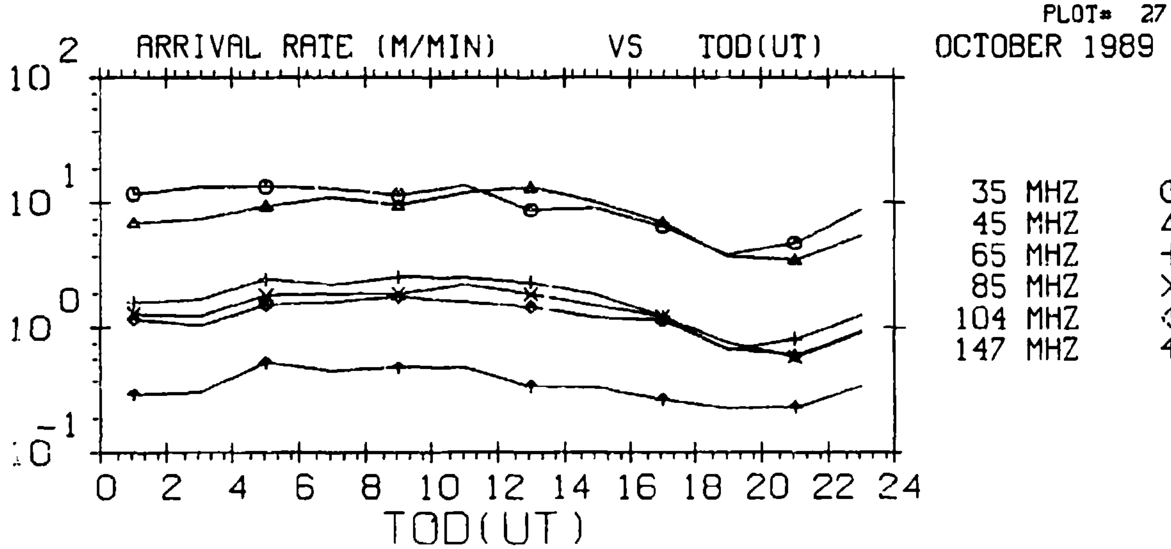
MENU*101,03-2
13-MAY-93
PLOT* 26.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

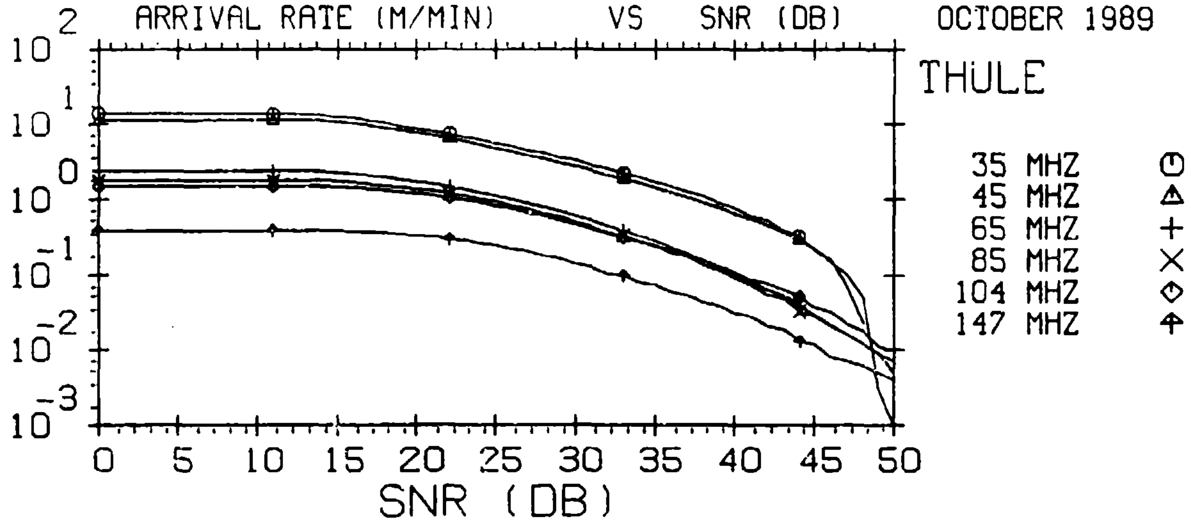
MENU*101,03-2
13-MAY-93
PLOT* 27.00




EXCEEDING 19.0 DB SNR
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

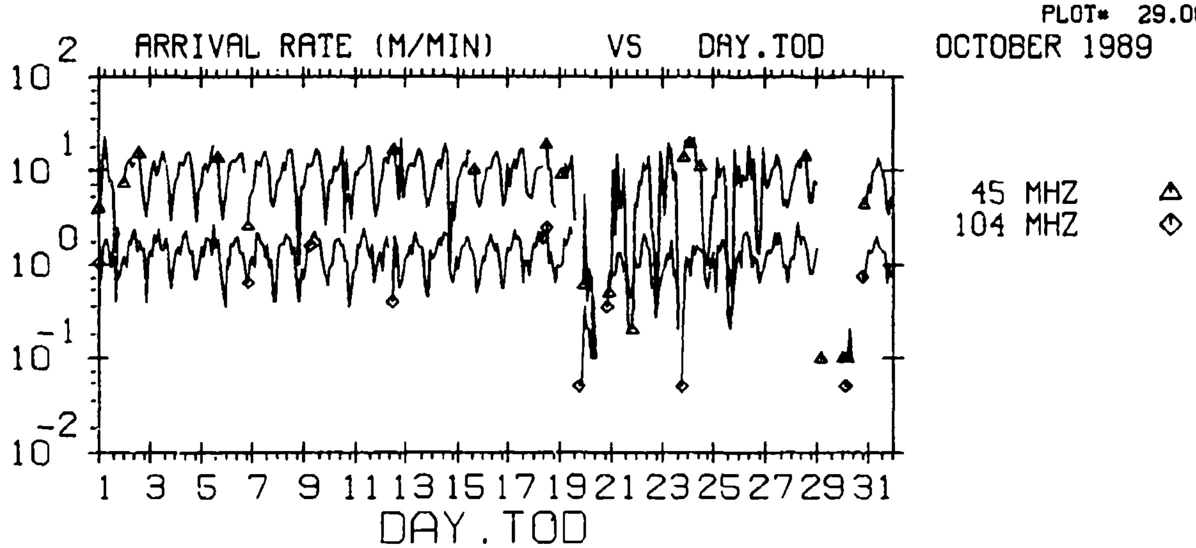
MENU*102,01-2
13-MAY-93
PLOT* 28.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

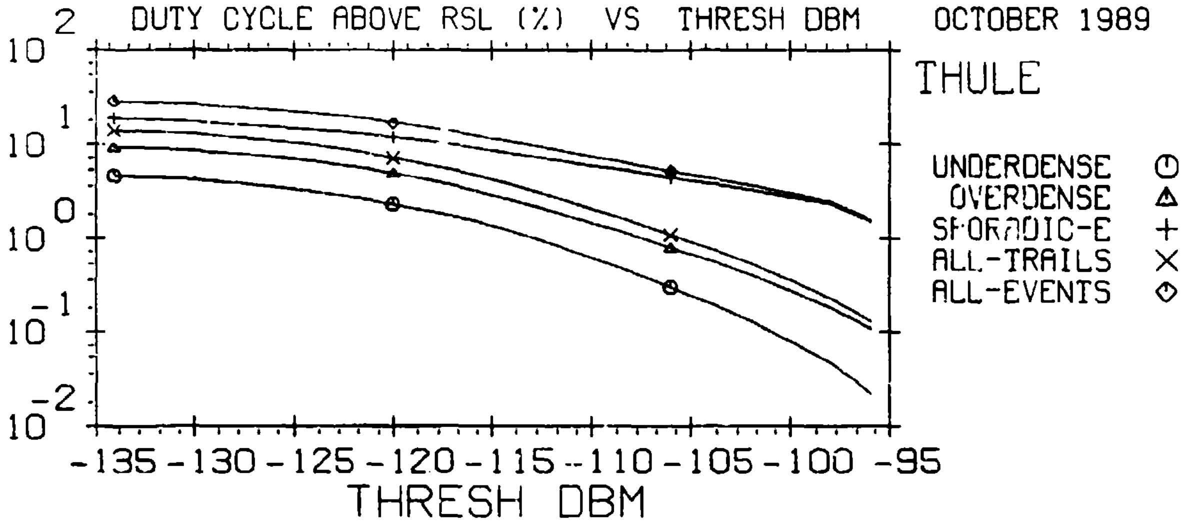
MENU*102,02-2
13-MAY-93
PLOT* 29.00




EXCEEDING 19.0 DB SNR
TYPE OF METEOR TRAIL - UNDERDENSE AND OVERDENSE
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION = HORIZONTAL
MAXIMUM DOWN TIME DUE TO SPORADIC-E - 240 SECONDS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

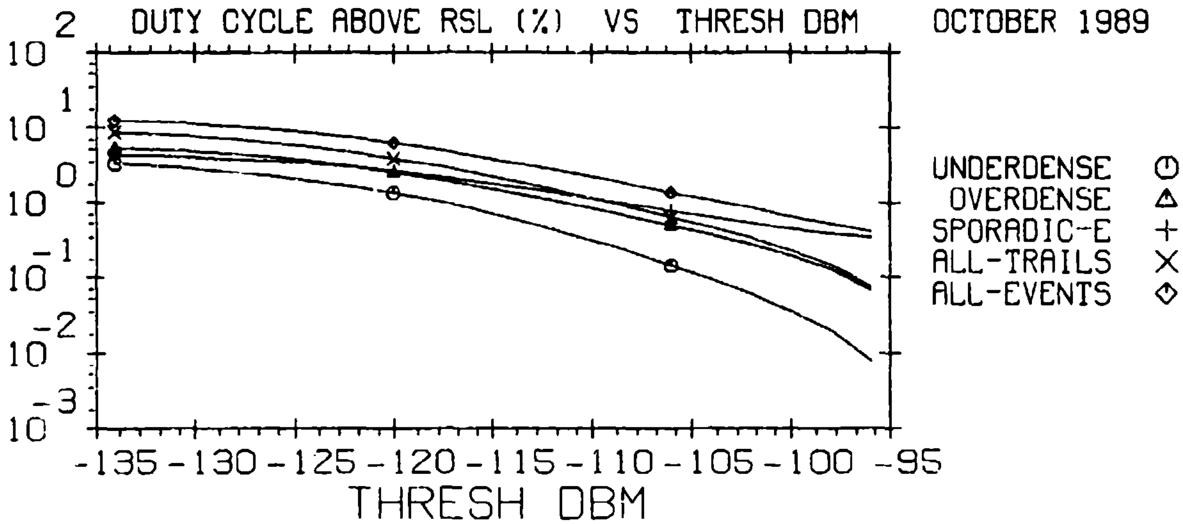
MENU*102,03-2
13-MAY-93
PLOT* 30.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU*103,06-2
13-MAY-93
PLOT* 31.00

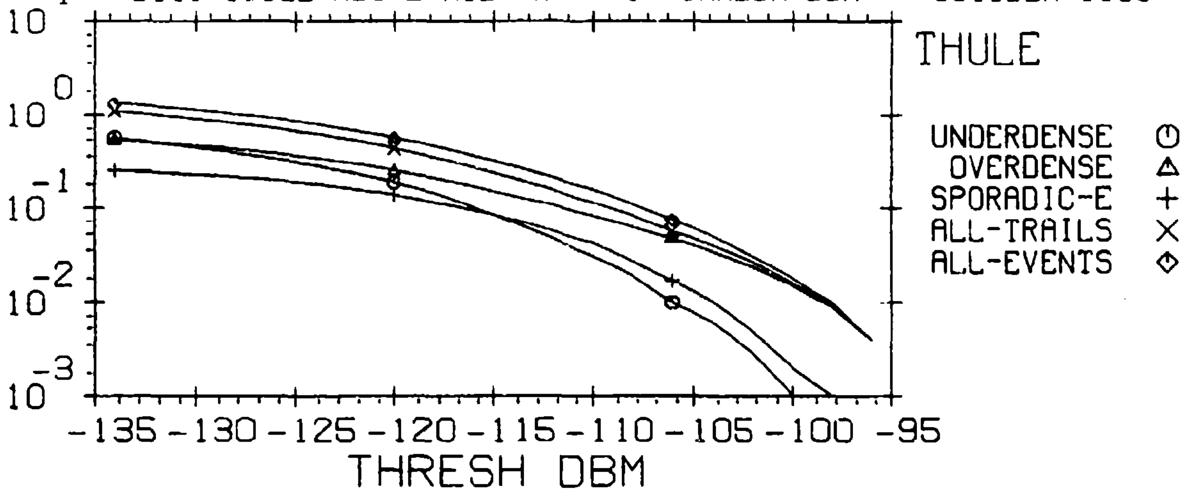



THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU*103,06-2
13-MAY-93
PLOT* 32.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

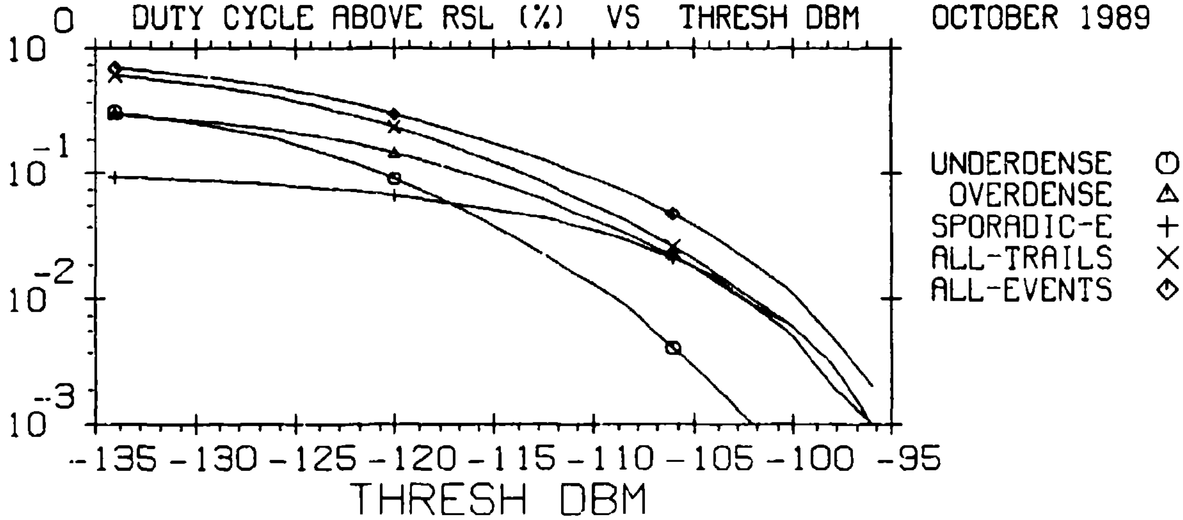
DUTY CYCLE ABOVE RSL (%) VS THRESH DBM OCTOBER 1989




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU*103,06-2
13-MAY-93
PLOT* 33.00

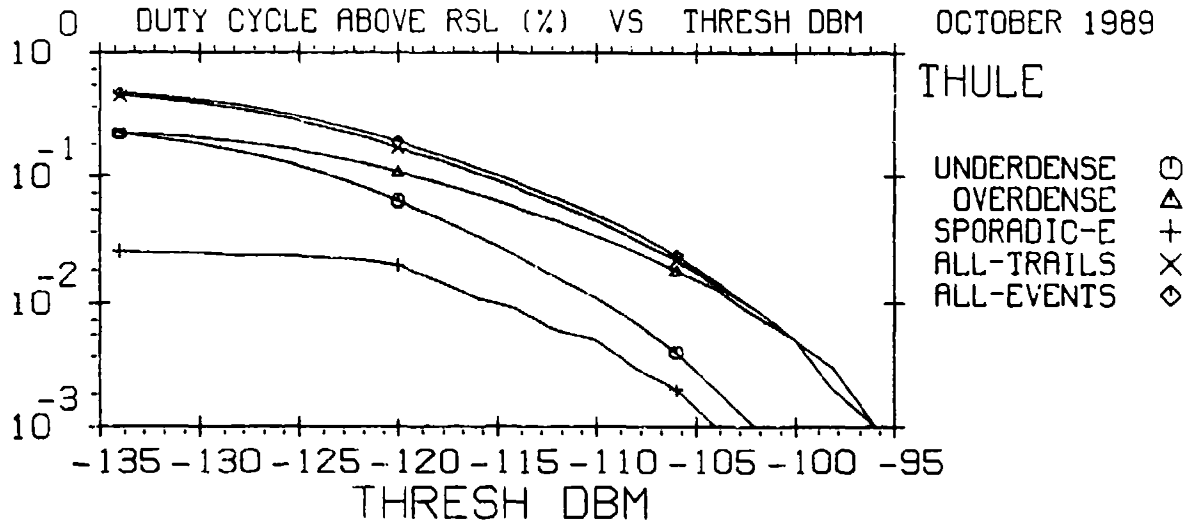
DUTY CYCLE ABOVE RSL (%) VS THRESH DBM OCTOBER 1989




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

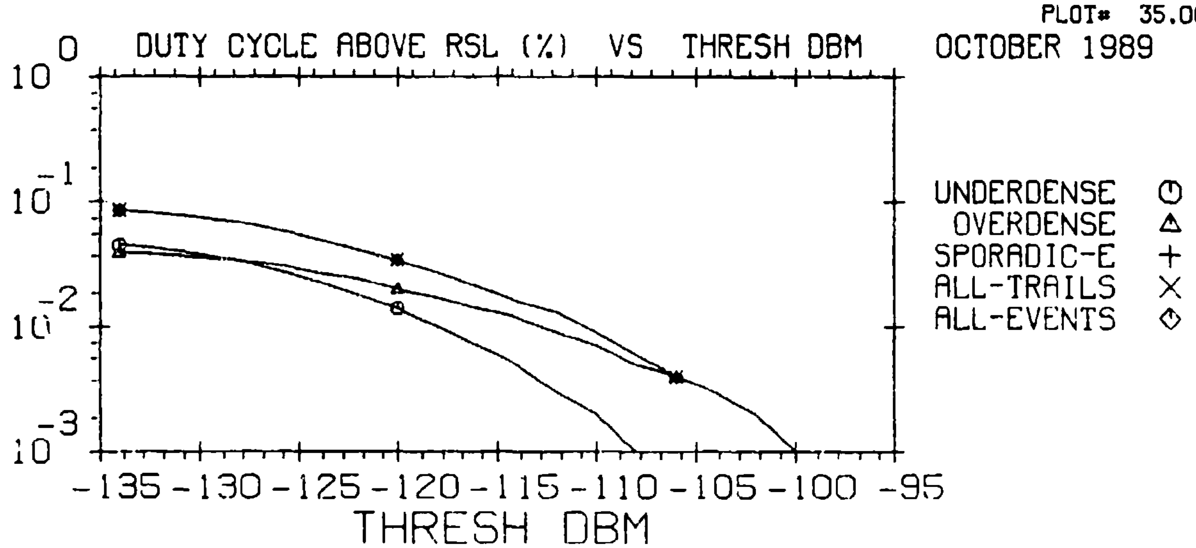
MENU*103,06-2
13-MAY-93
PLOT* 34.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

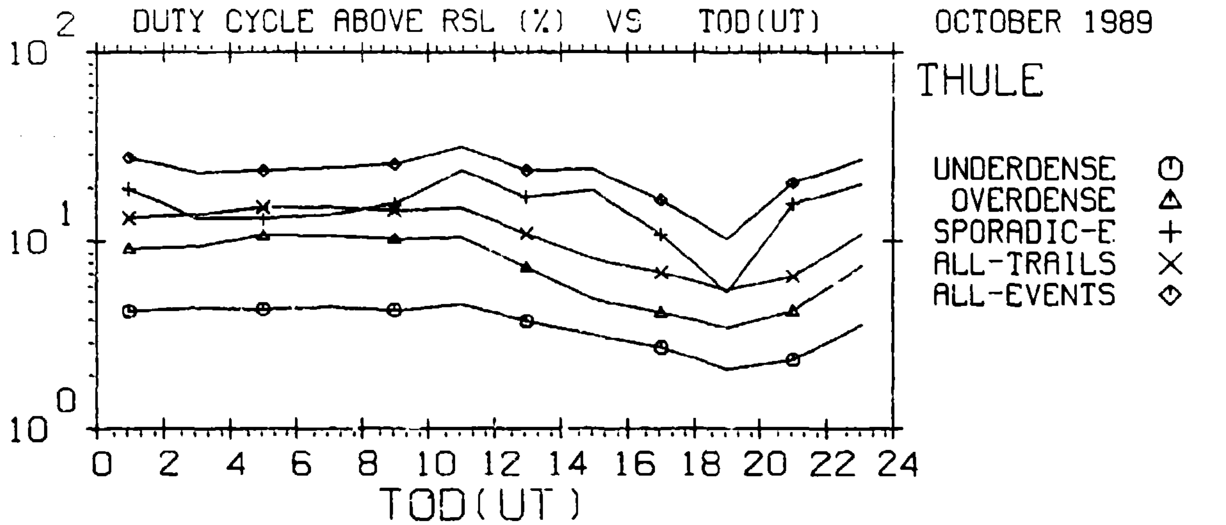
MENU*103,06-2
13-MAY-93
PLOT* 35.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

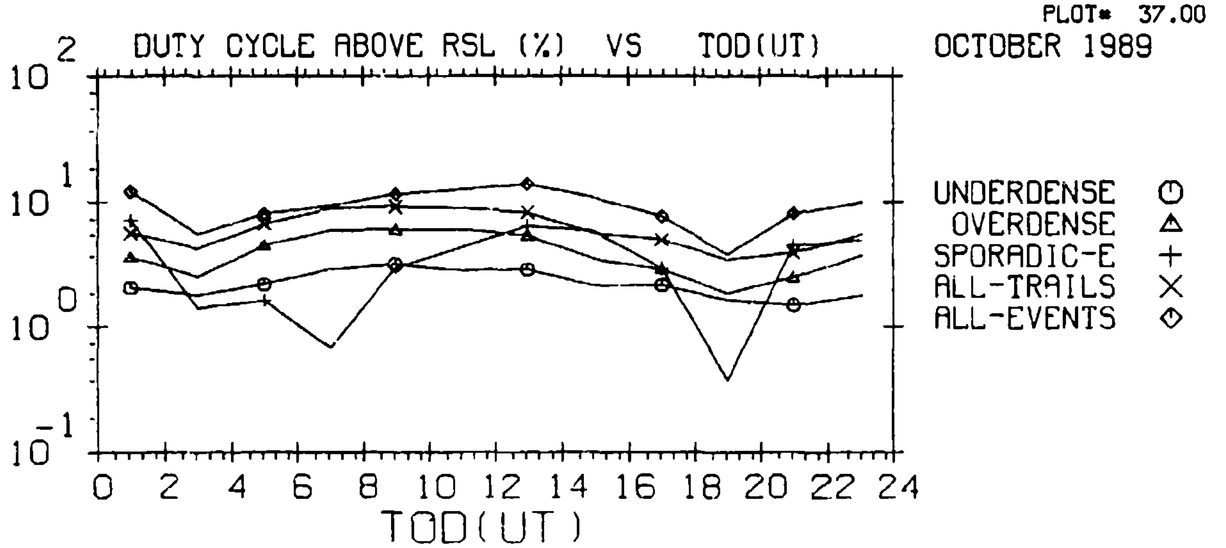
MENU*103,06-2
13-MAY-93
PLOT* 36.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

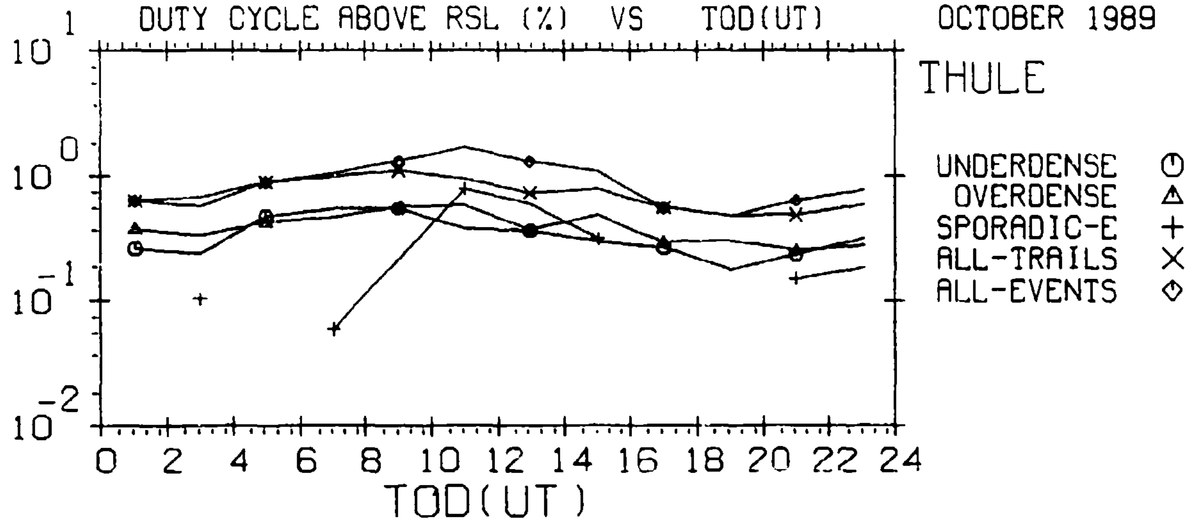
MENU*103,07-2
13-MAY-93
PLOT* 37.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

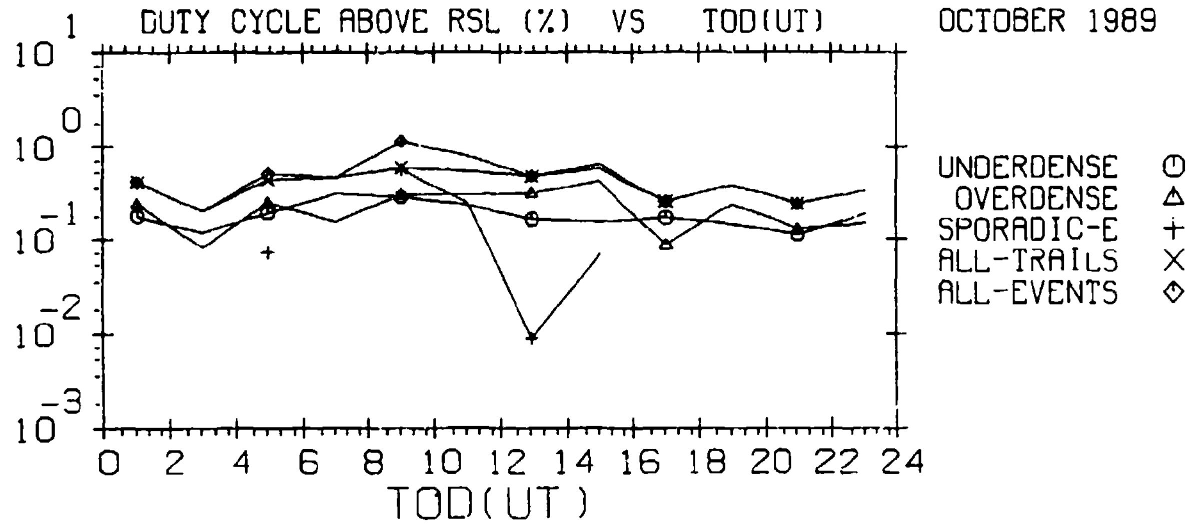
MENU*103,07-2
13-MAY-93
PLOT* 38.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

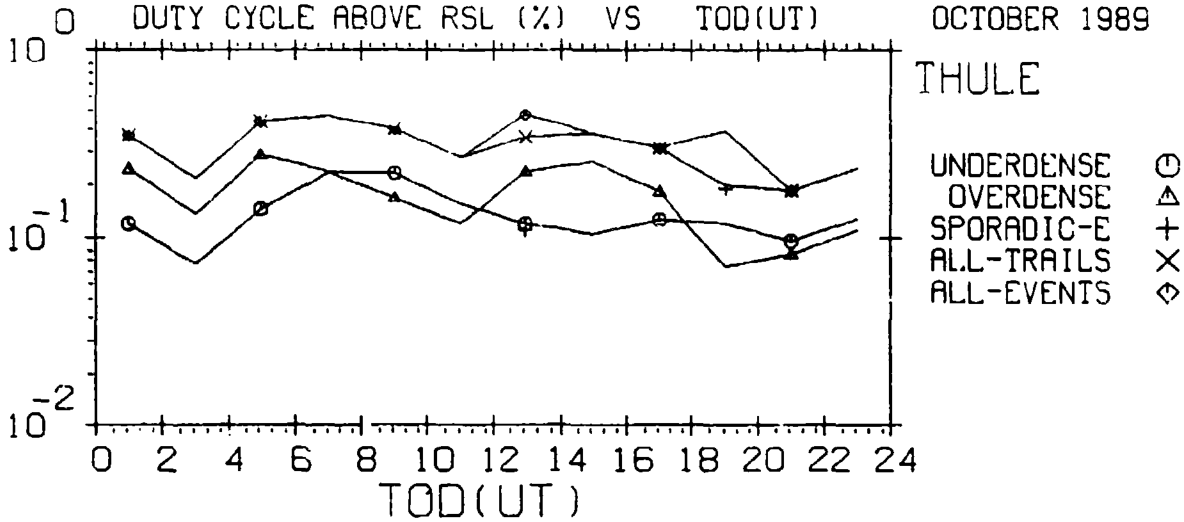
MENU*103,07-2
13-MAY-93
PLOT* 39.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

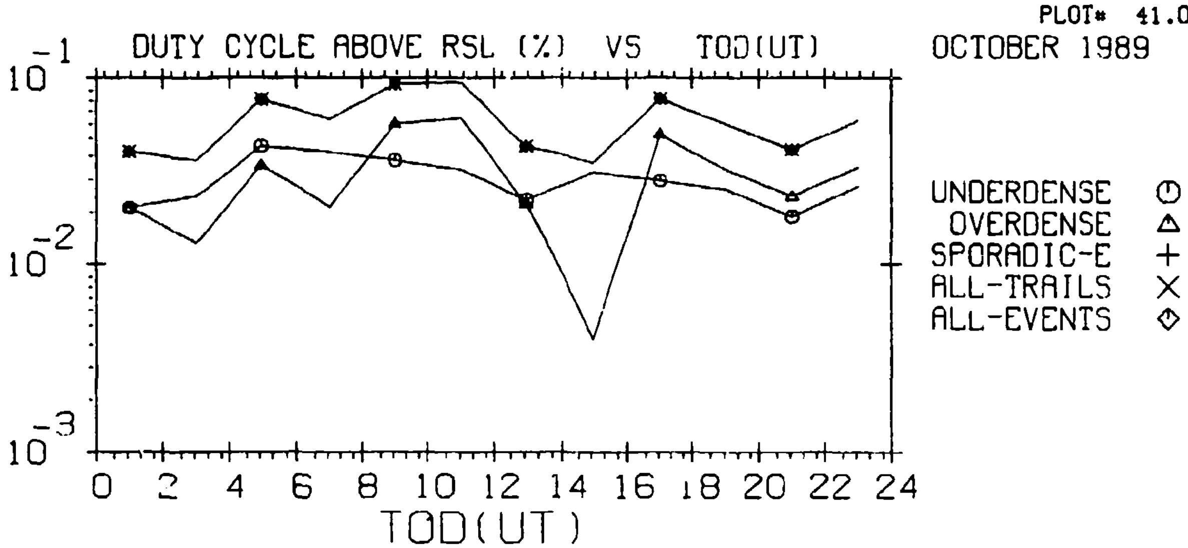
MENU*103,07-2
13-MAY-93
PLOT* 40.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

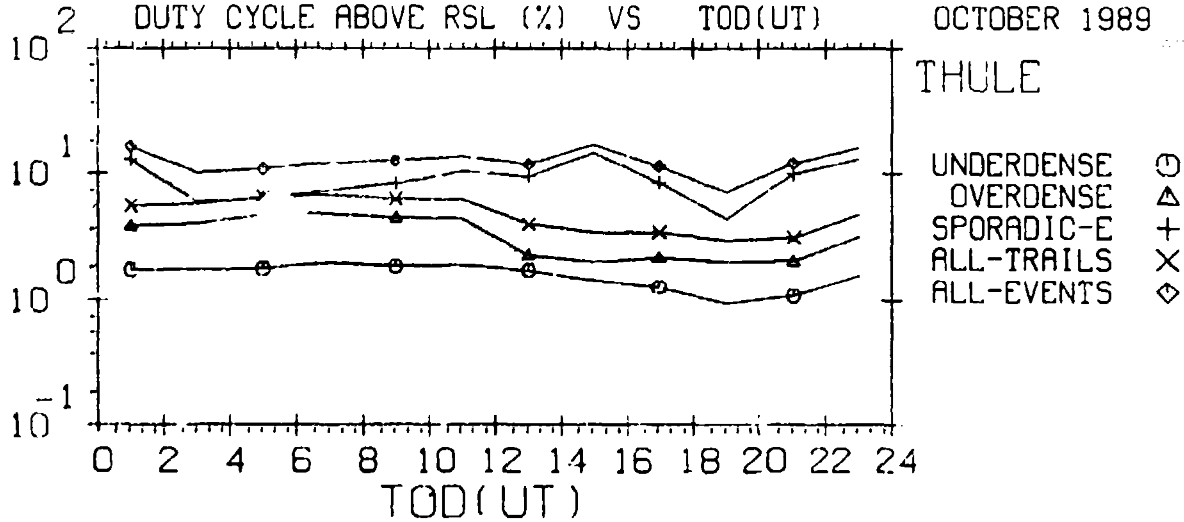
MENU*103,07-2
13-MAY-93
PLOT* 41.00




THRESHOLD - -126.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

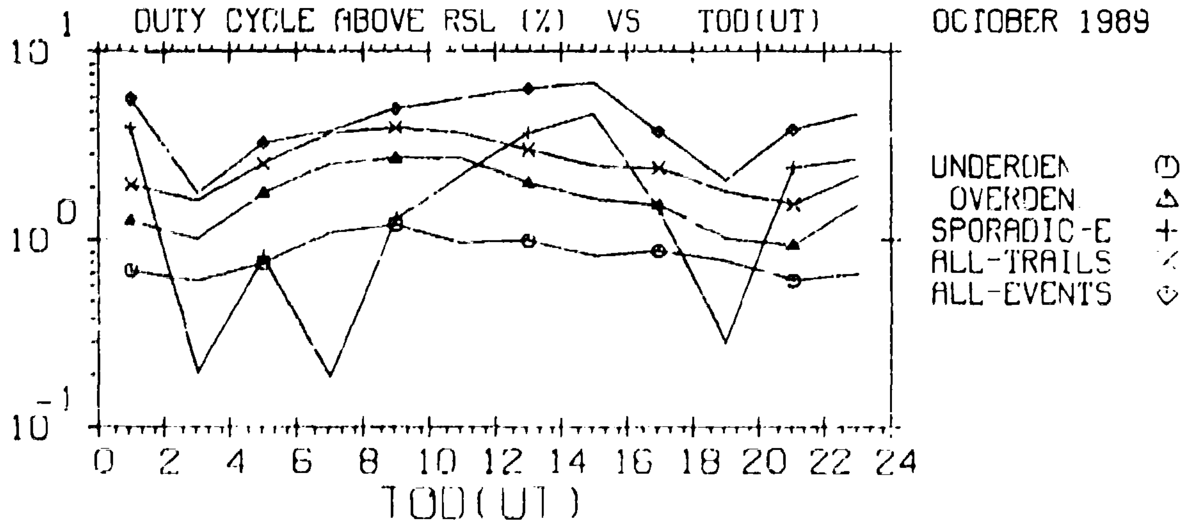
MENU*103,07-2
13-MAY-93
PLOT* 42.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

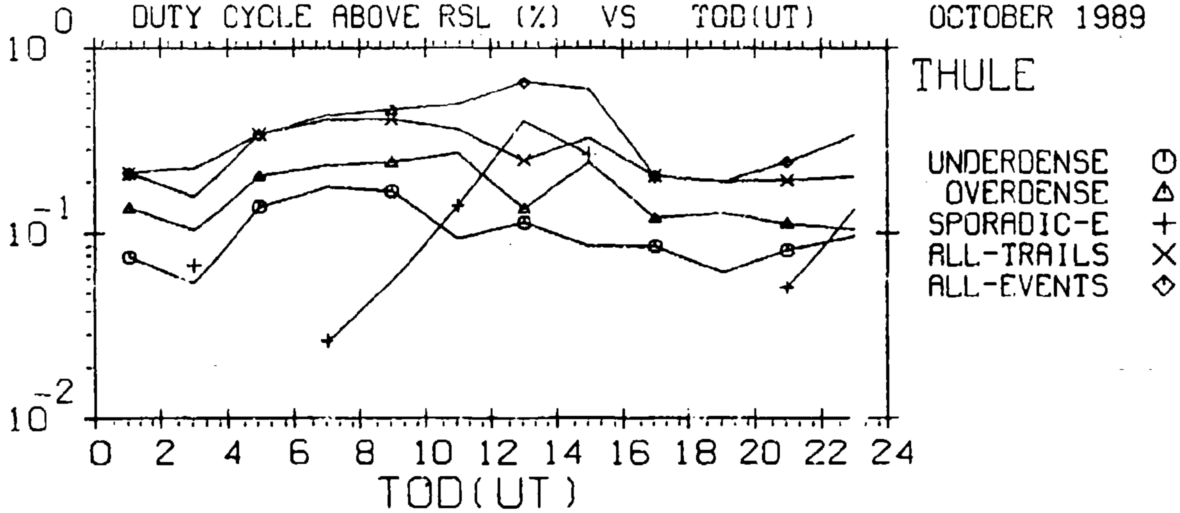
MENU*103,07-2
13-MAY-93
PLOT* 43.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 45 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

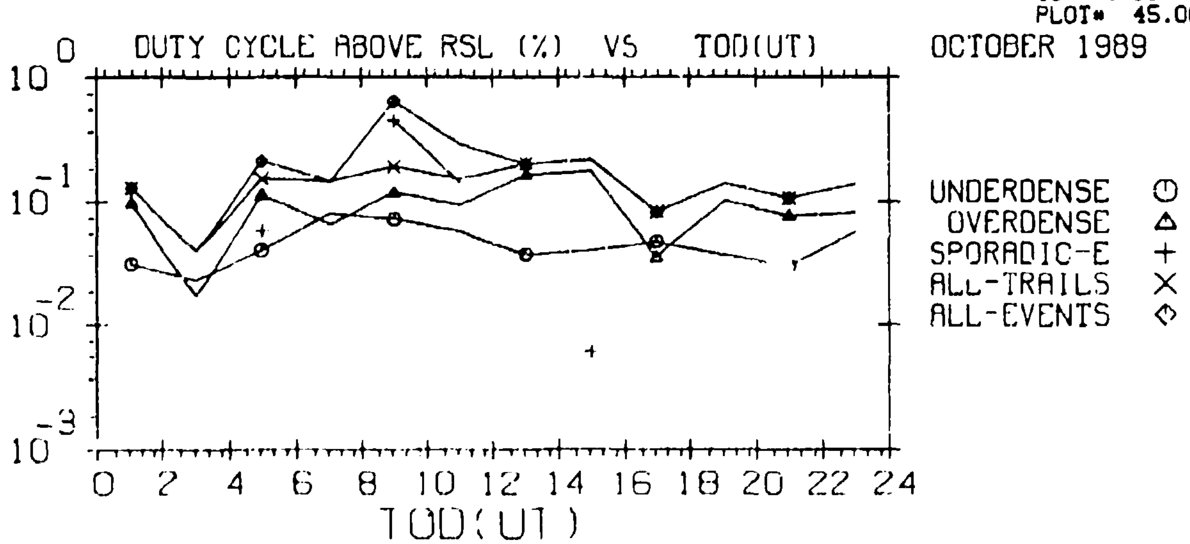
MENU*103,07-2
13-MAY-93
PLOT* 44.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

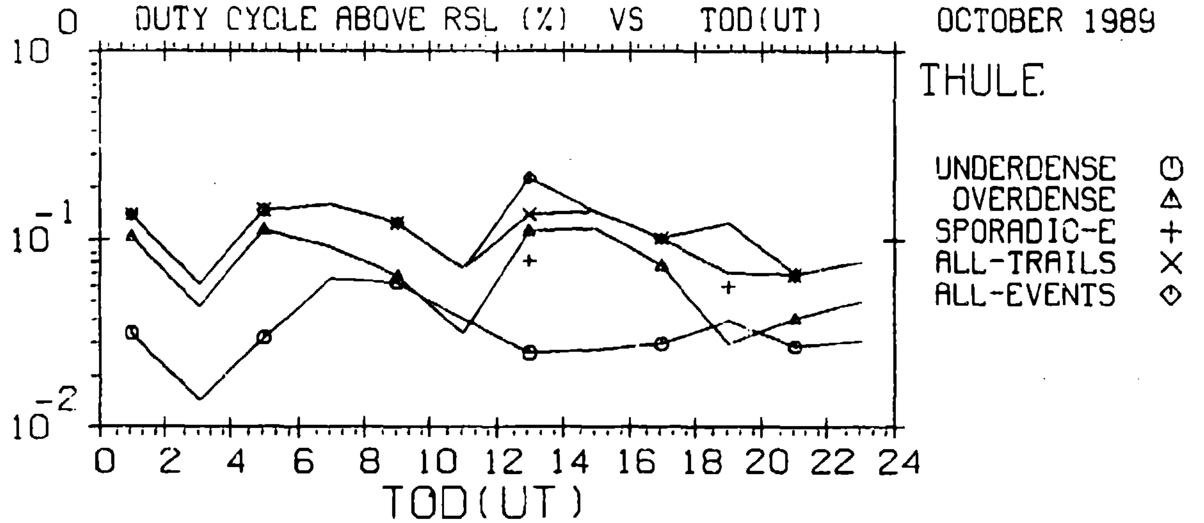
MENU#103,07-2
13-MAY-93
PLOT# 45.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

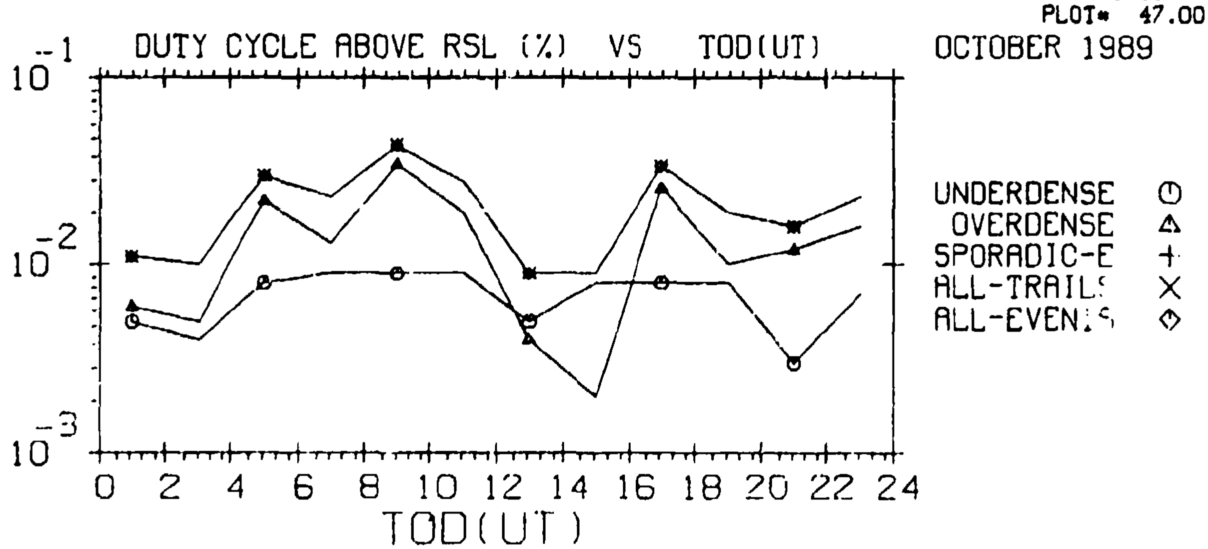
MENU#103,07-2
13-MAY-93
PLOT# 46.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

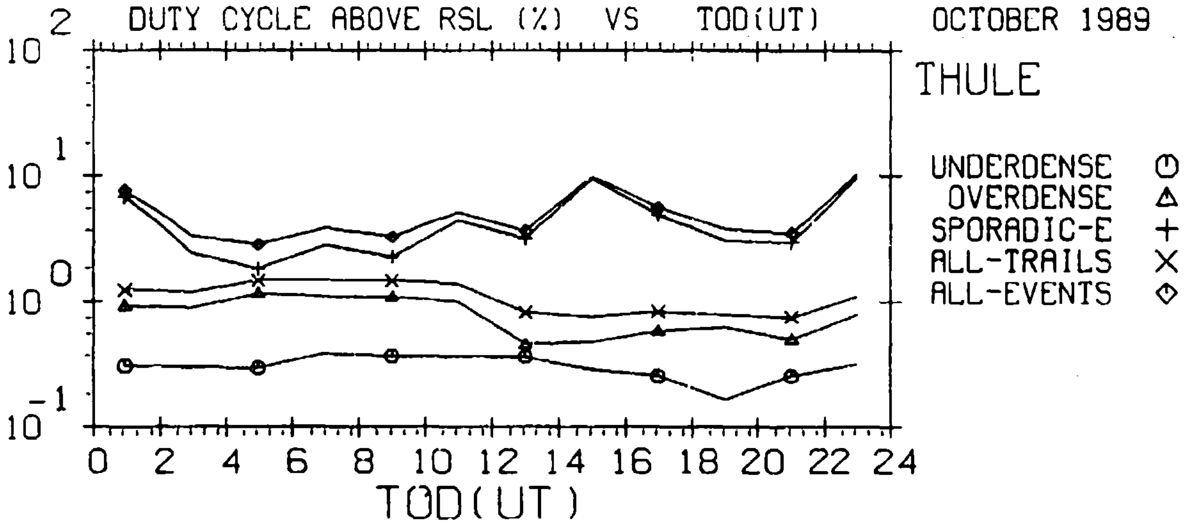
MENU*103,07-2
13-MAY-93
PLOT* 47.00




THRESHOLD - -116.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

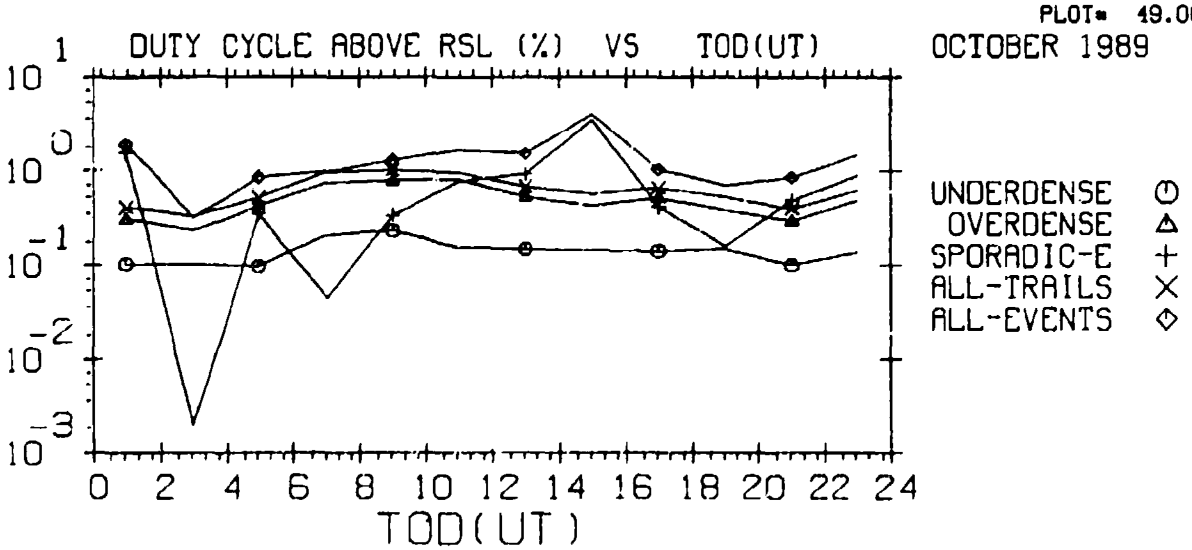
MENU*103,07-2
13-MAY-93
PLOT* 48.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD = -106.0 DBM RSL
FREQUENCY = 35 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

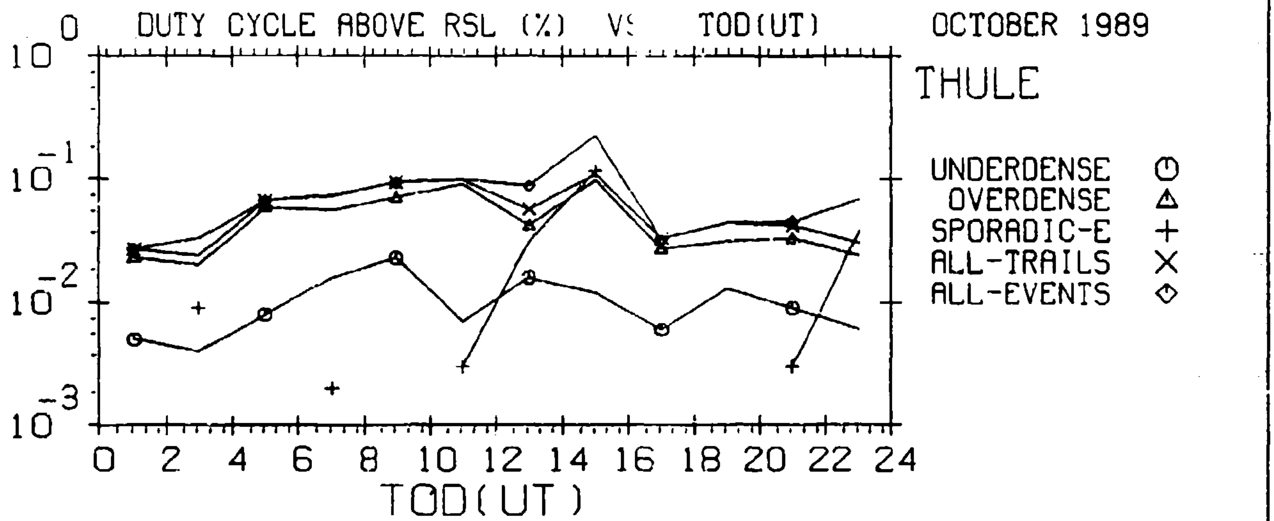
MENU=103,07-2
13-MAY-93
PLOT= 49.00




THRESHOLD = -106.0 DBM RSL
FREQUENCY = 45 MHZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

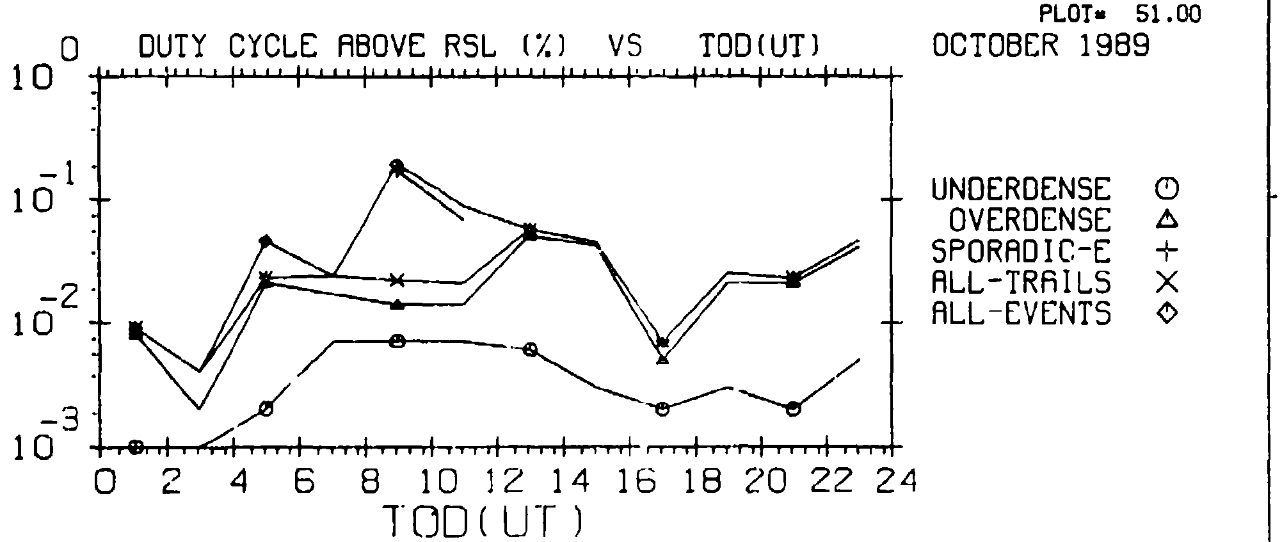
MENU=103,07-2
13-MAY-93
PLOT= 50.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD = -106.0 DBM RSL
FREQUENCY = 65 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU=103,07-2
13-MAY-93
PLOT= 51.00

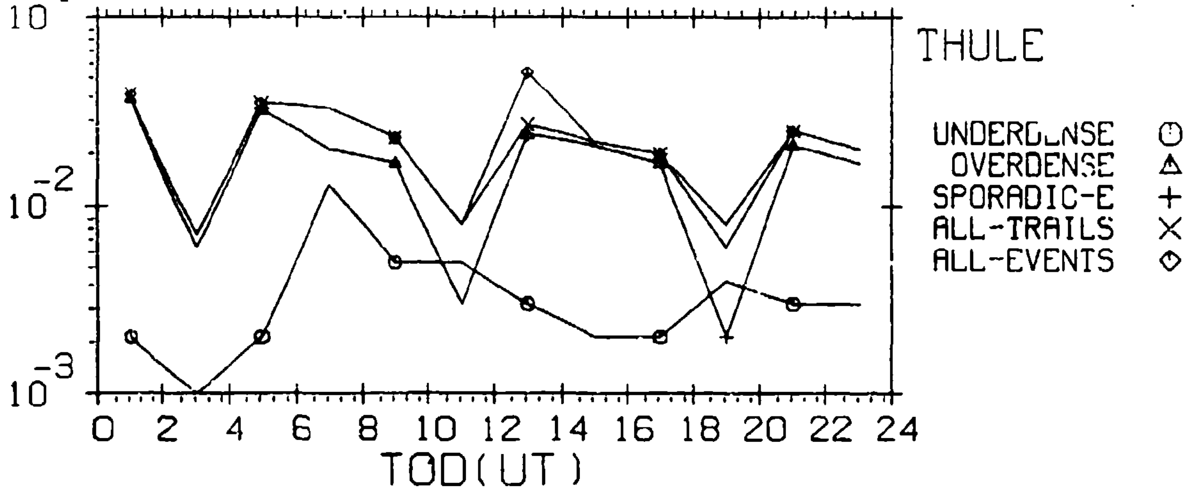



THRESHOLD = -106.0 DBM RSL
FREQUENCY = 85 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU=103,07-2
13-MAY-93
PLOT= 52.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

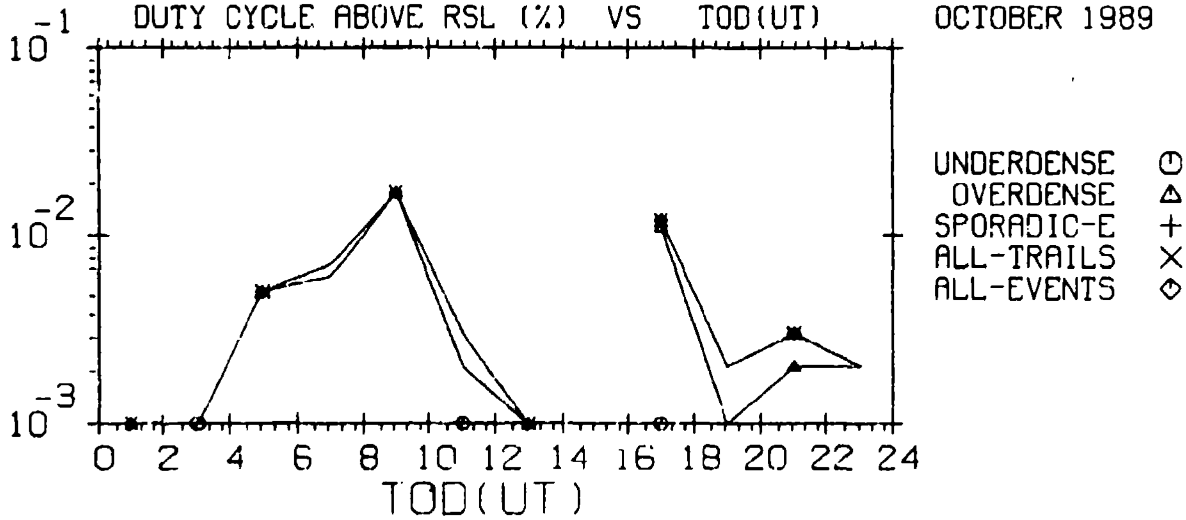
DUTY CYCLE ABOVE RSL (%) VS TOD(UT) OCTOBER 1989




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 104 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

MENU*103,07-2
13-MAY-93
PLOT* 53.00

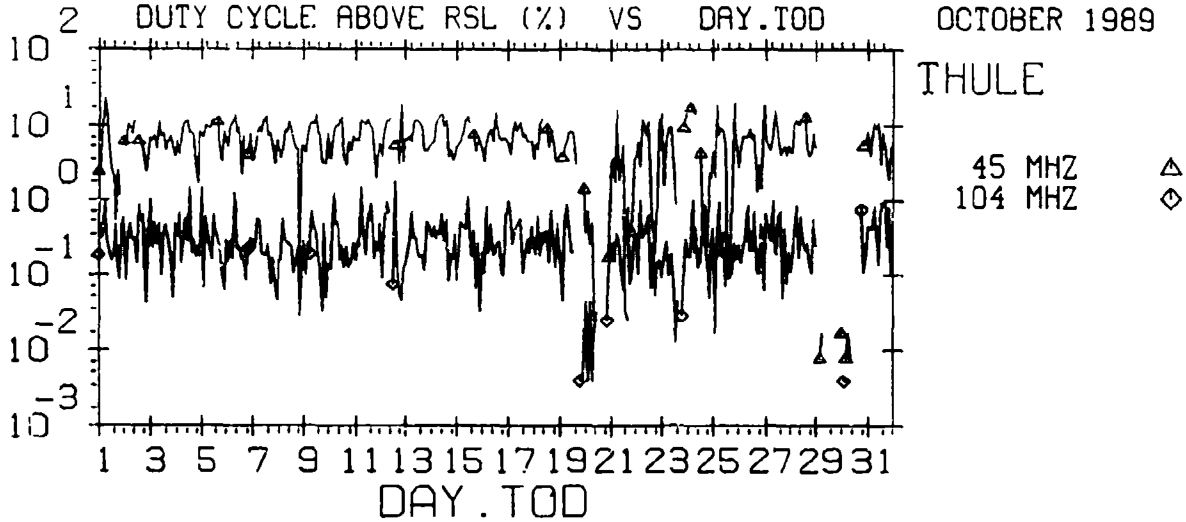
DUTY CYCLE ABOVE RSL (%) VS TOD(UT) OCTOBER 1989




THRESHOLD - -106.0 DBM RSL
FREQUENCY - 147 MHZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

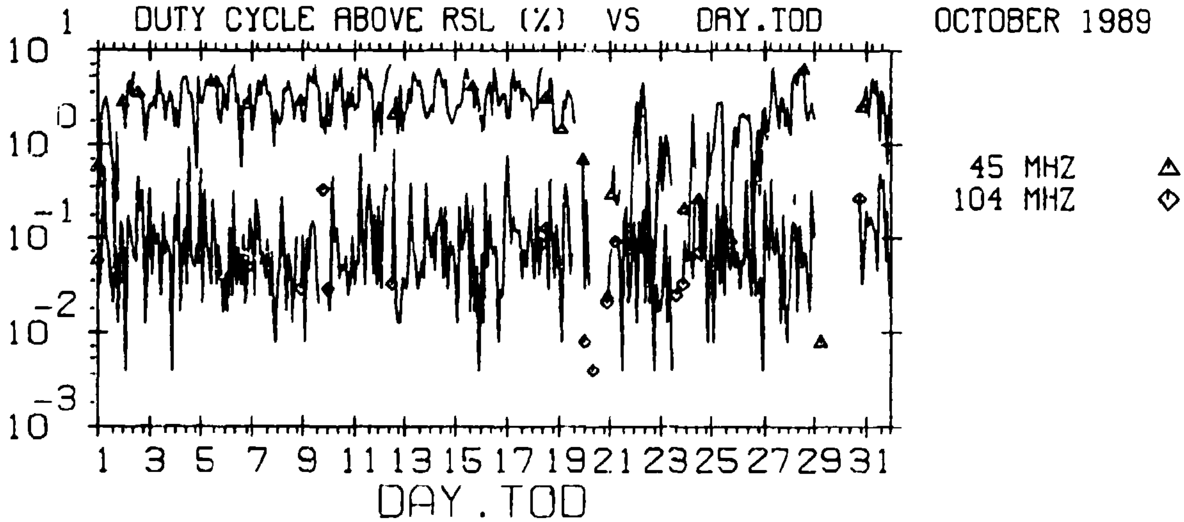
MENU*103,07-2
13-MAY-93
PLOT* 54.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD = -126.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

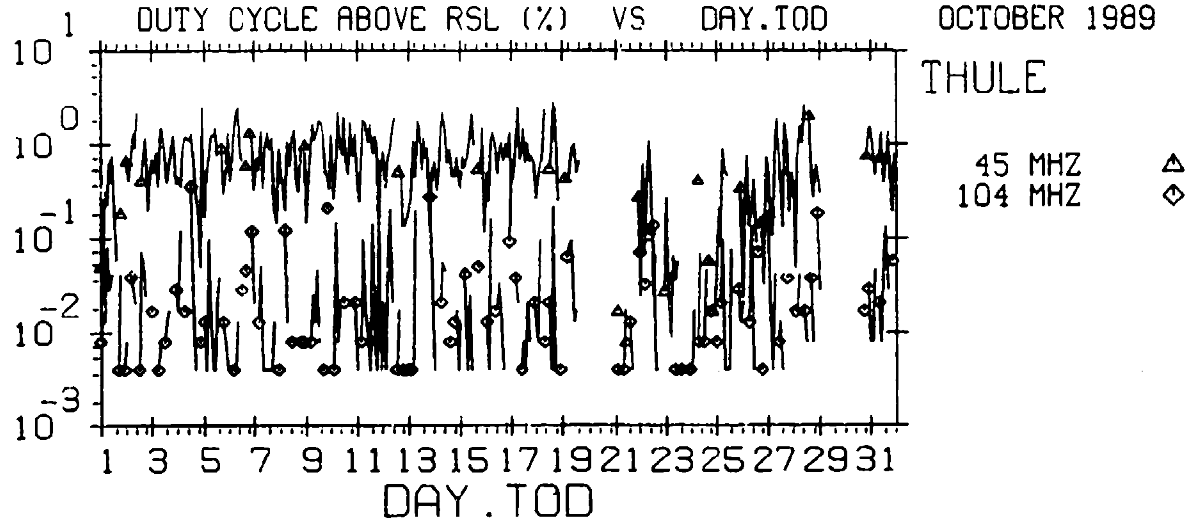
MENU=103,09-2
13-MAY-93
PLOT= 55.00




THRESHOLD = -116.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

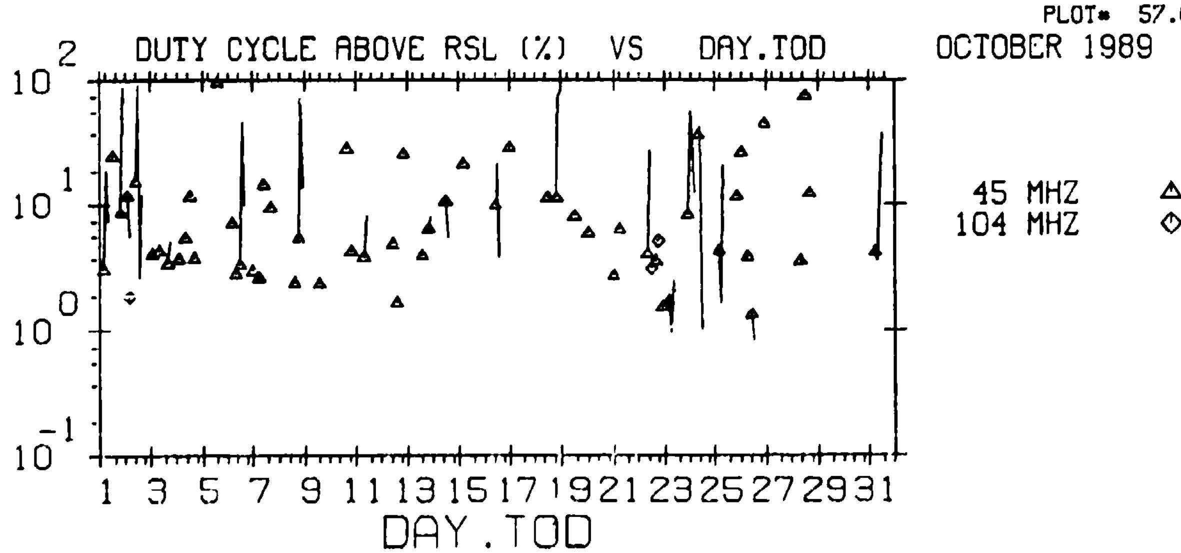
MENU=103,09-2
13-MAY-93
PLOT= 56.00

## GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -106.0 DBM RSL
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

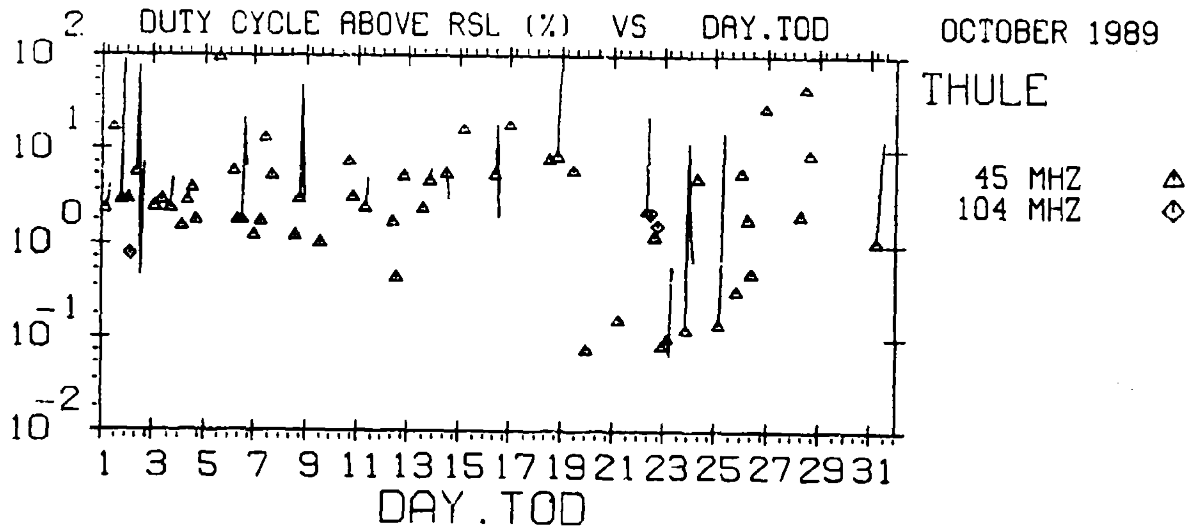
MENU*103,09-2
13-MAY-93
PLOT* 57.00




THRESHOLD - -126.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

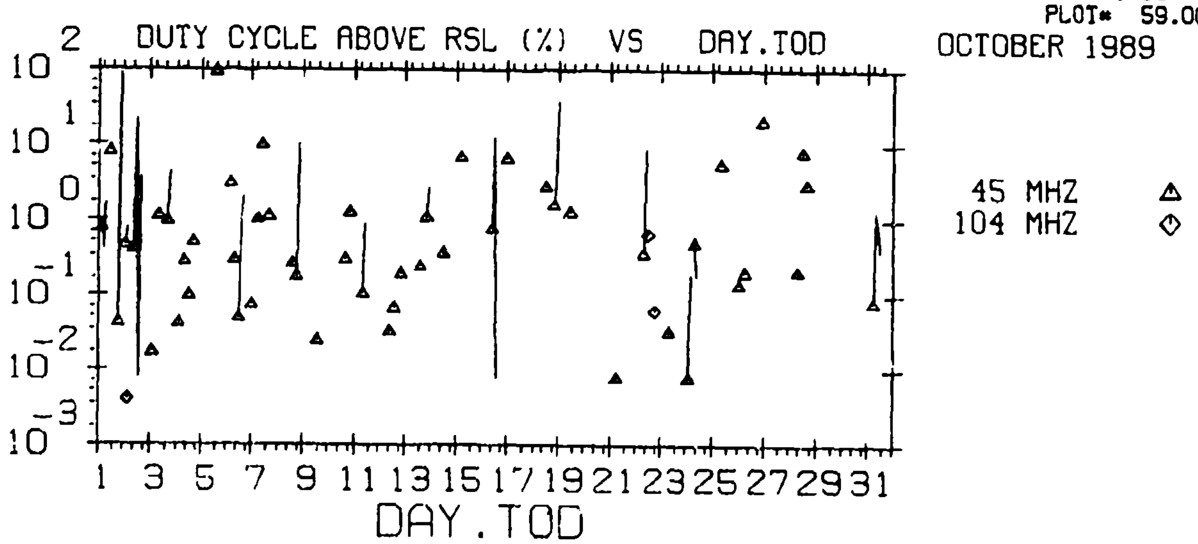
MENU*103,09-2
13-MAY-93
PLOT* 58.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THRESHOLD - -116.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

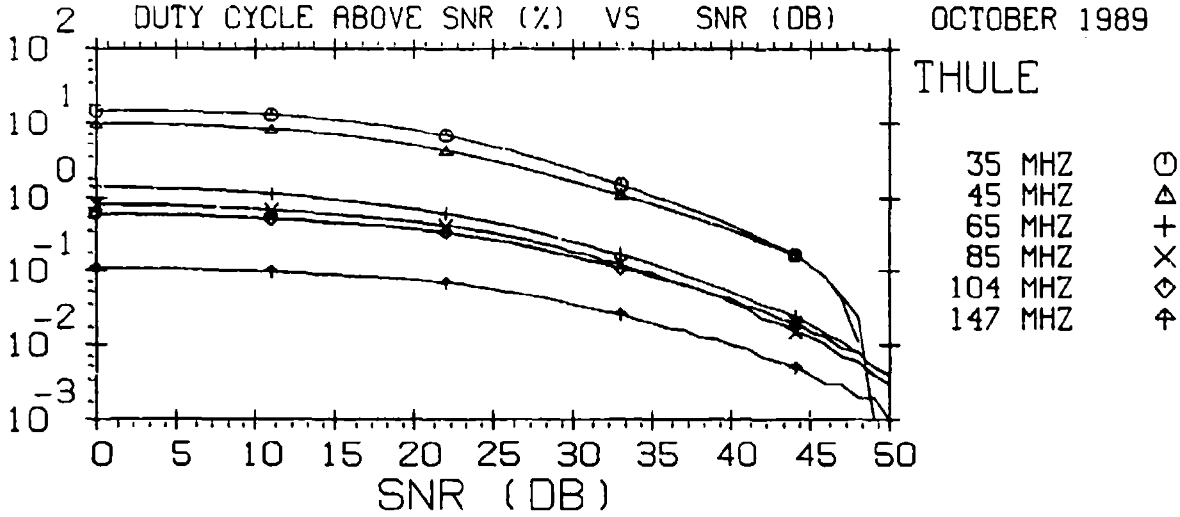
MENU* 103,09-2
13-MAY-93
PLOT* 59.00




THRESHOLD - -106.0 DBM RSL
THE EVENT CLASS IS SPORADIC-E
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

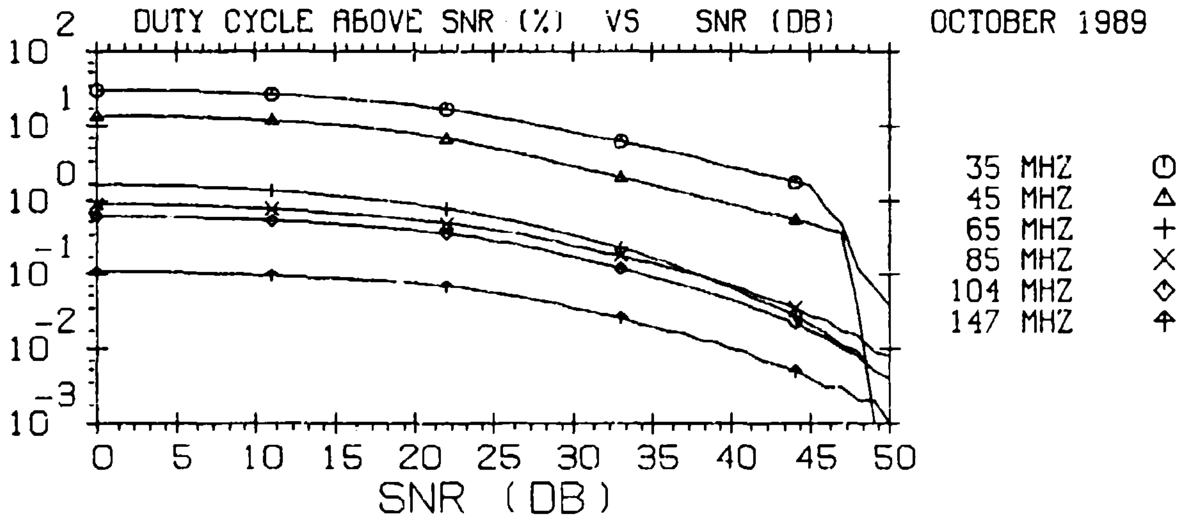
MENU* 103,09-2
13-MAY-93
PLOT* 60.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

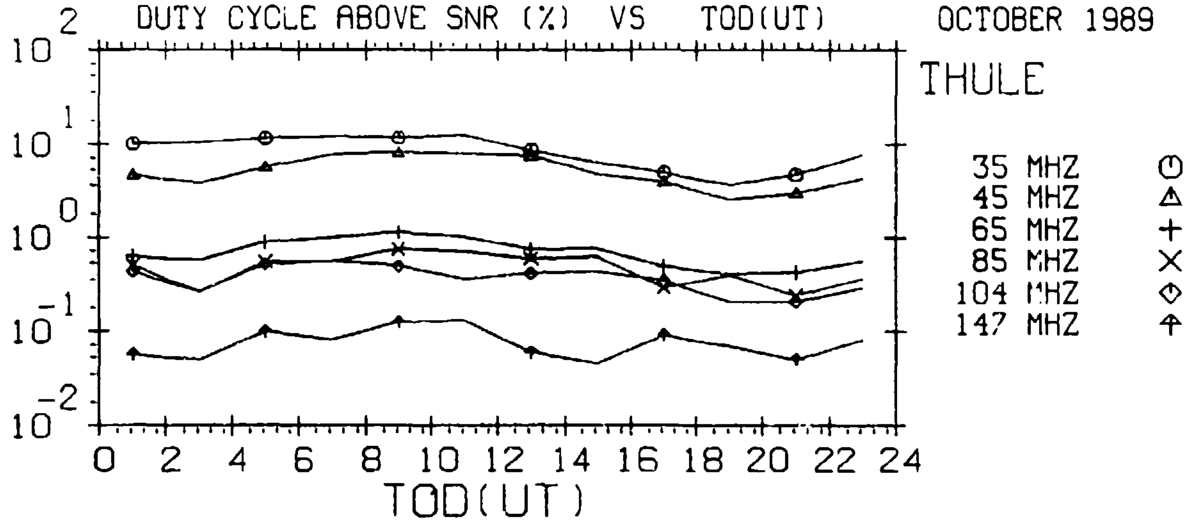
MENU*104,02-2
13-MAY-93
PLOT* 61.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

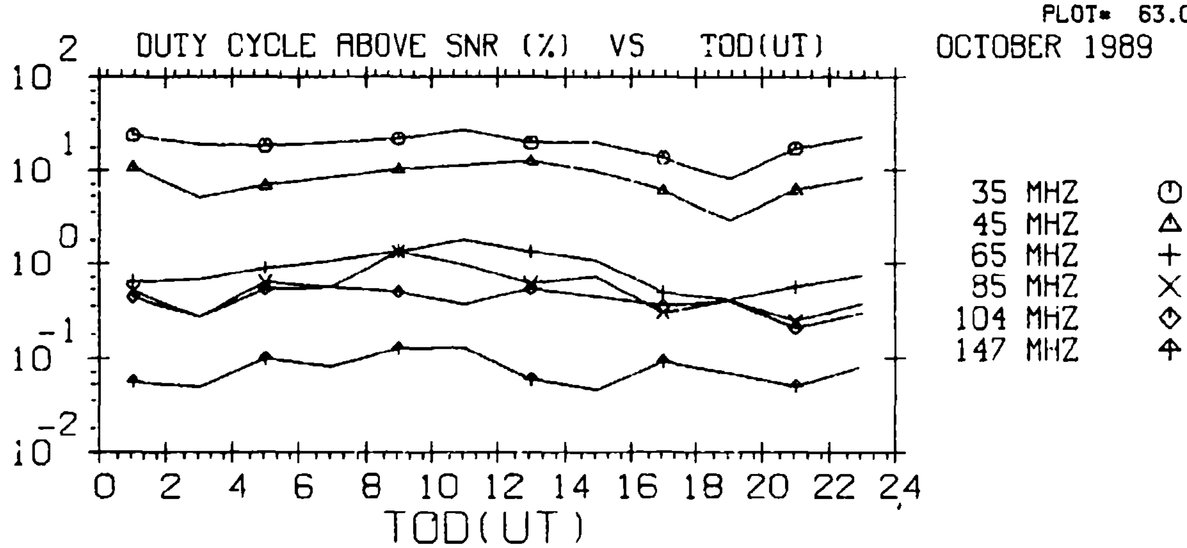
MENU*104,02-2
13-MAY-93
PLOT* 62.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




SIGNAL-TO-NOISE RATIO - 19.0 DB
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

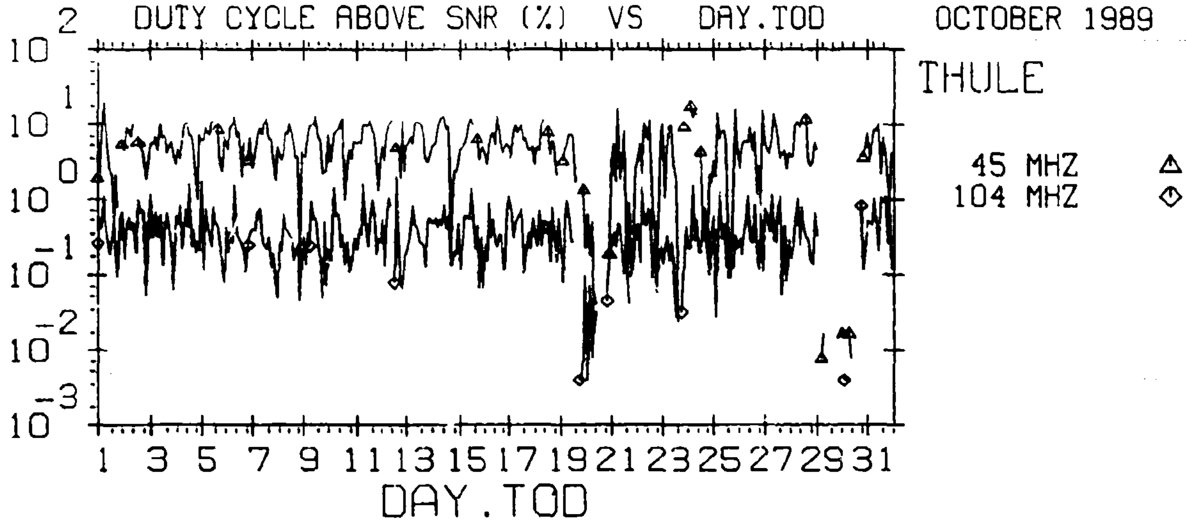
MENU*104,03-2
13-MAY-93
PLOT* 63.00




SIGNAL-TO-NOISE RATIO - 19.0 DB
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
POLARIZATION - HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

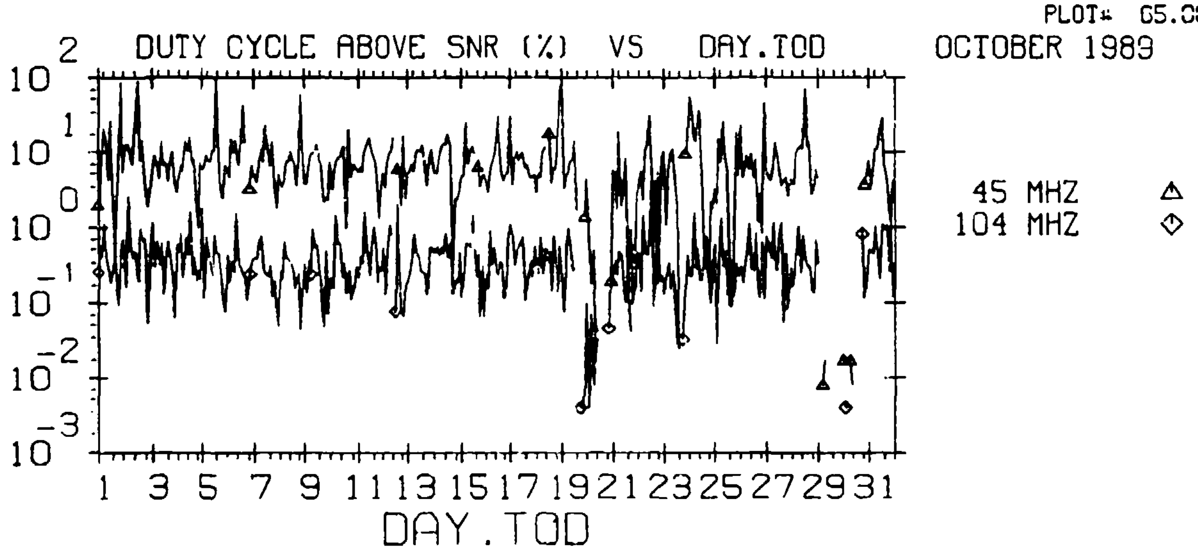
MENU*104,03-2
13-MAY-93
PLOT* 64.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




SIGNAL-TO-NOISE RATIO = 19.0 DB
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

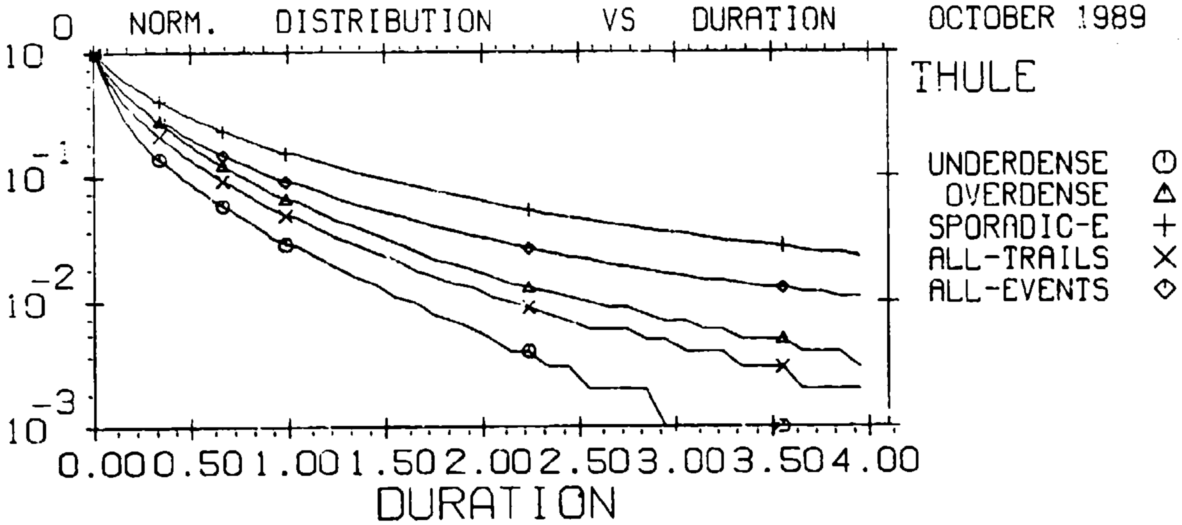
MENU#104,09-2
13-MAY-93
PLOT# 65.00




SIGNAL-TO-NOISE RATIO = 19.0 DB
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
POLARIZATION = HORIZONTAL
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

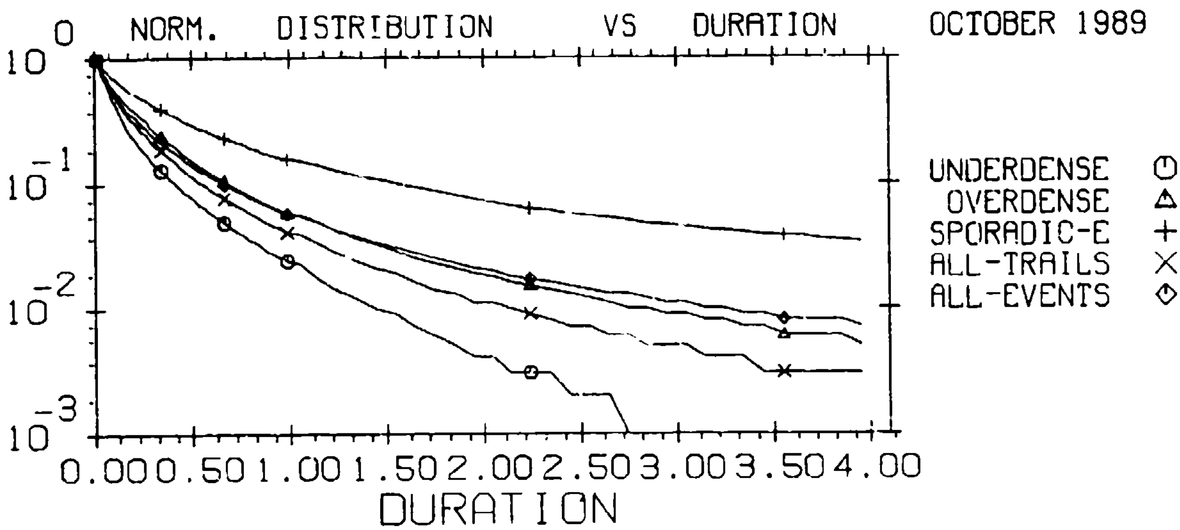
MENU#104,09-2
13-MAY-93
PLOT# 66.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 39686. OVER - 46694. SPOR-E - 58124.
TRAILS - 86380. EVENTS - 144504.

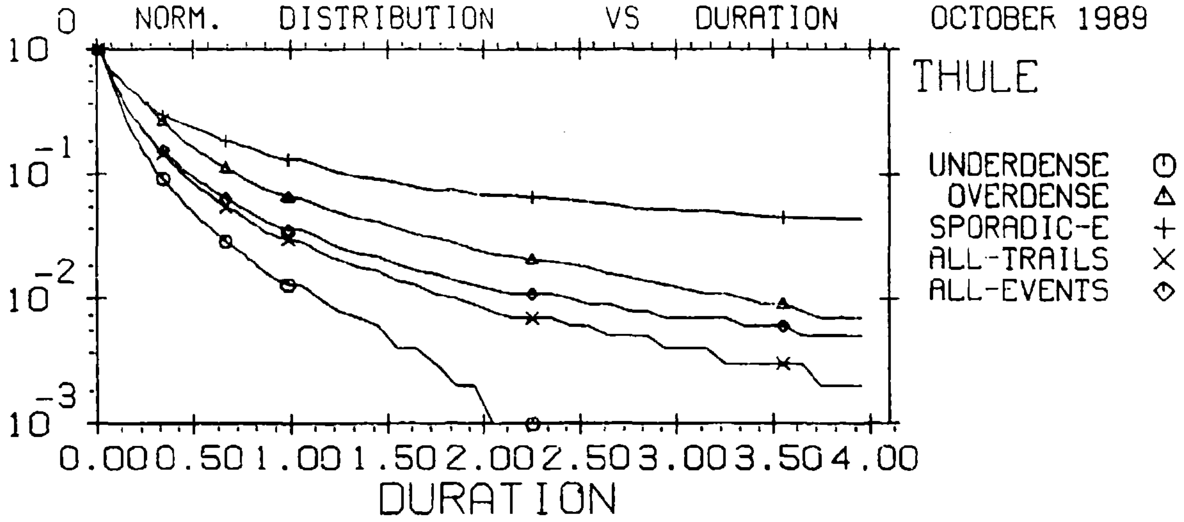
MENU*106,02-4
13-MAY-93
PLOT* 67.00




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 27709. OVER - 27578. SPOR-E - 9625.
TRAILS - 55287. EVENTS - 64912.

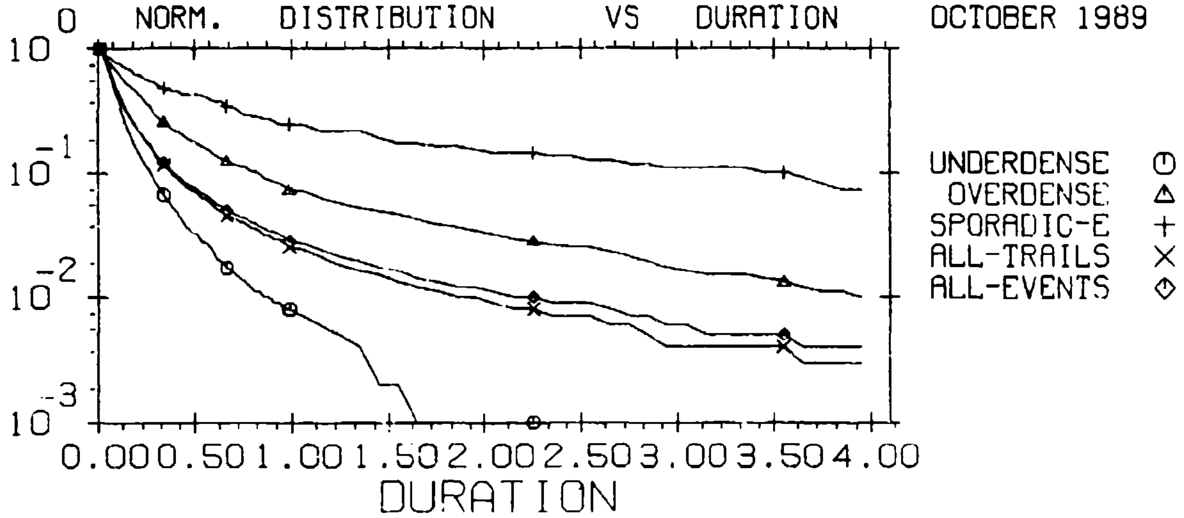
MENU*106,02-4
13-MAY-93
PLOT* 68.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 8265. OVER - 3768. SPOR-E - 850.
TRAILS - 12033. EVENTS - 12883.

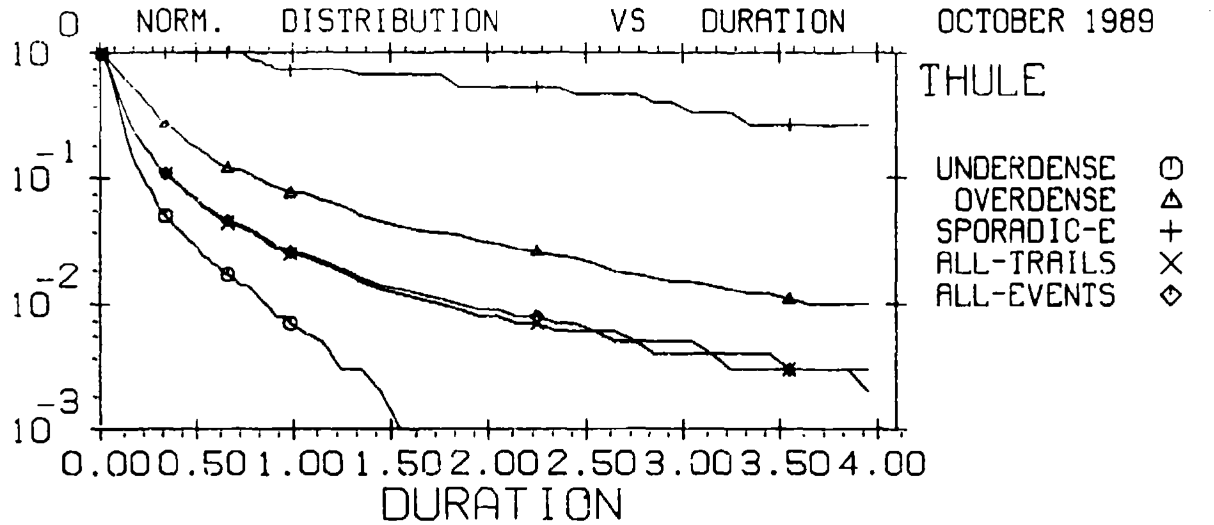
MENU*106,02-4
13-MAY-93
PLOT* 69.00




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5441. OVER - 1927. SPOR-E - 109.
TRAILS - 7368. EVENTS - 7477.

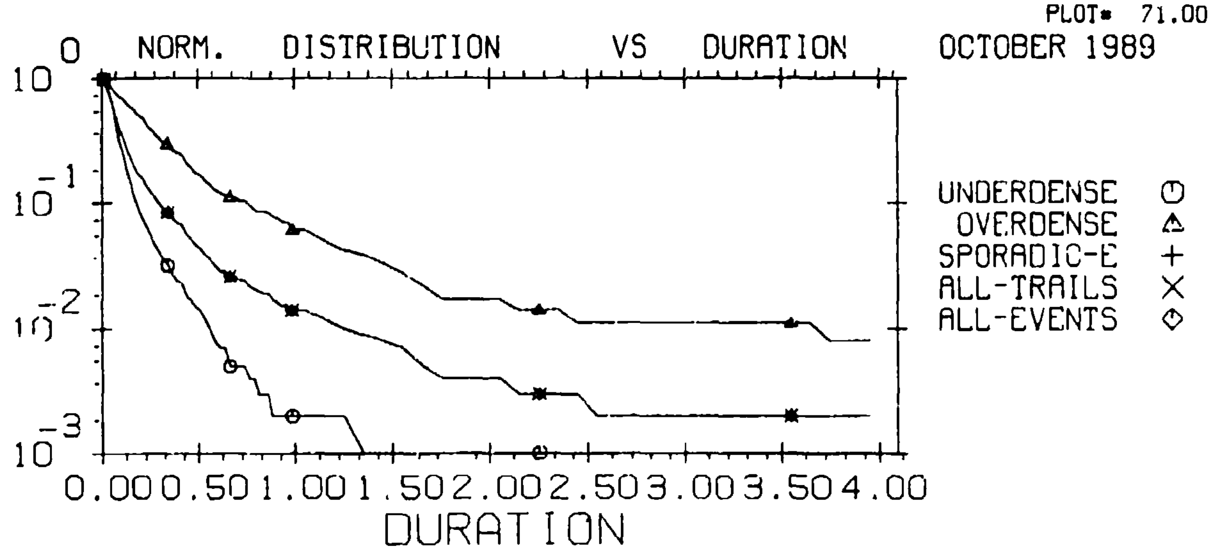
MENU*106,02-4
13-MAY-93
PLOT* 70.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 5723. OVER - 1981. SPOR-E - 15.
TRAILS - 7704. EVENTS - 7719.

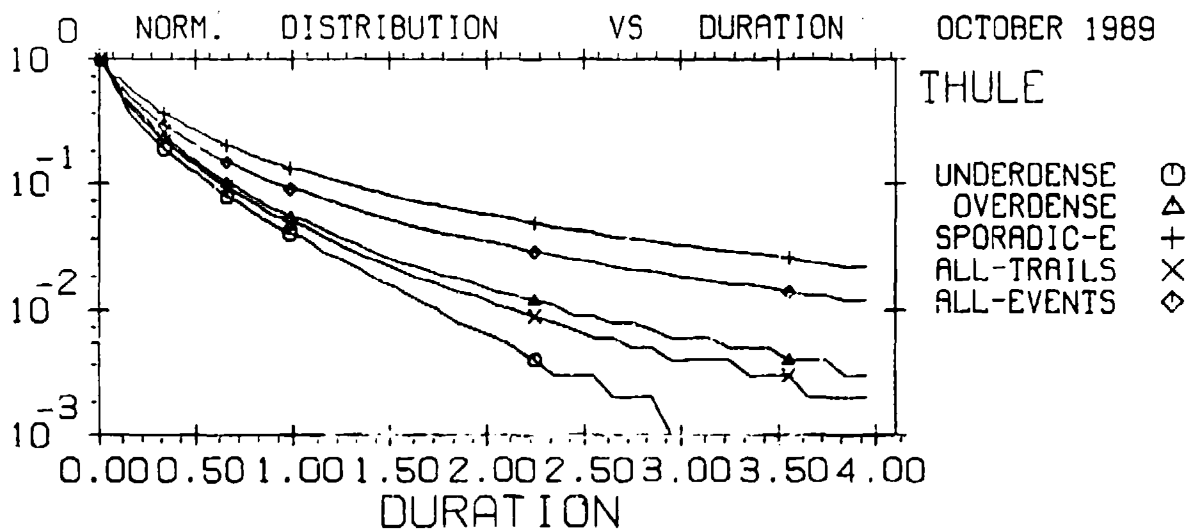
MENU*106,02-4
13-MAY-93
PLOT* 71.00




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1466. OVER - 359. SPOR-E - 0.
TRAILS - 1825. EVENTS - 1825.

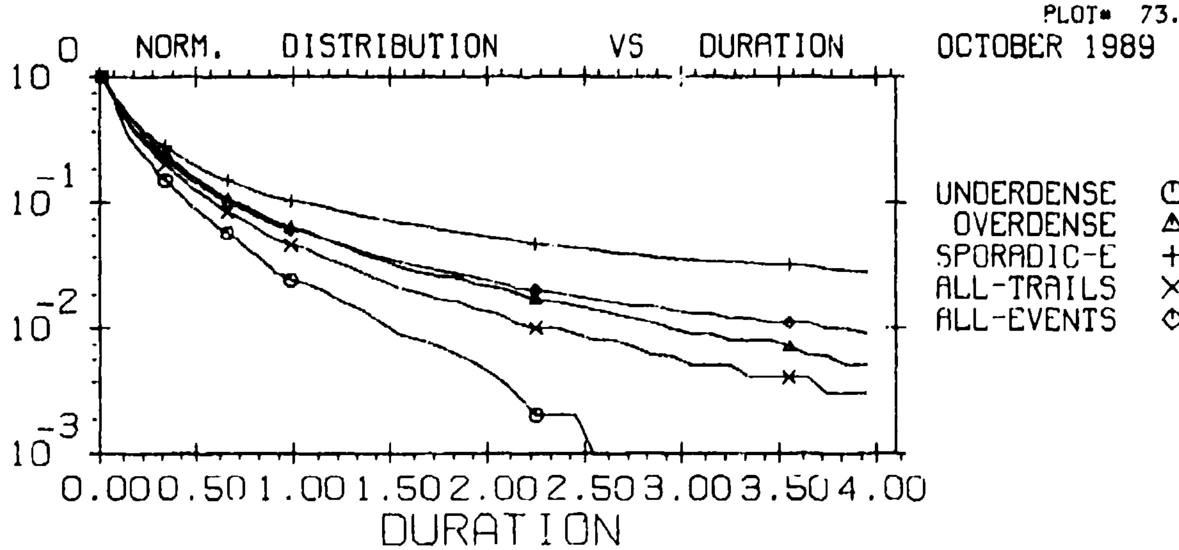
MENU*106,02-4
13-MAY-93
PLOT* 72.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 13575. OVER - 21942. SPOR-E - 35692.
TRAILS - 35517. EVENTS - 71209.

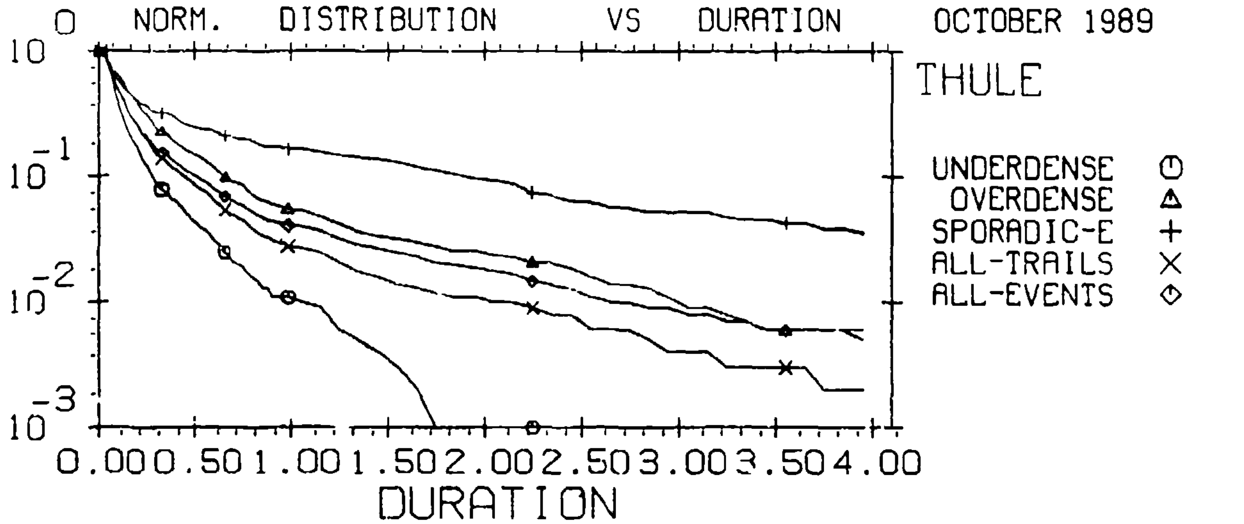
MENU=106,02-4
13-MAY-93
PLOT= 73.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 9110. OVER - 10883. SPOR-E - 7043.
TRAILS - 19993. EVENTS - 27036.

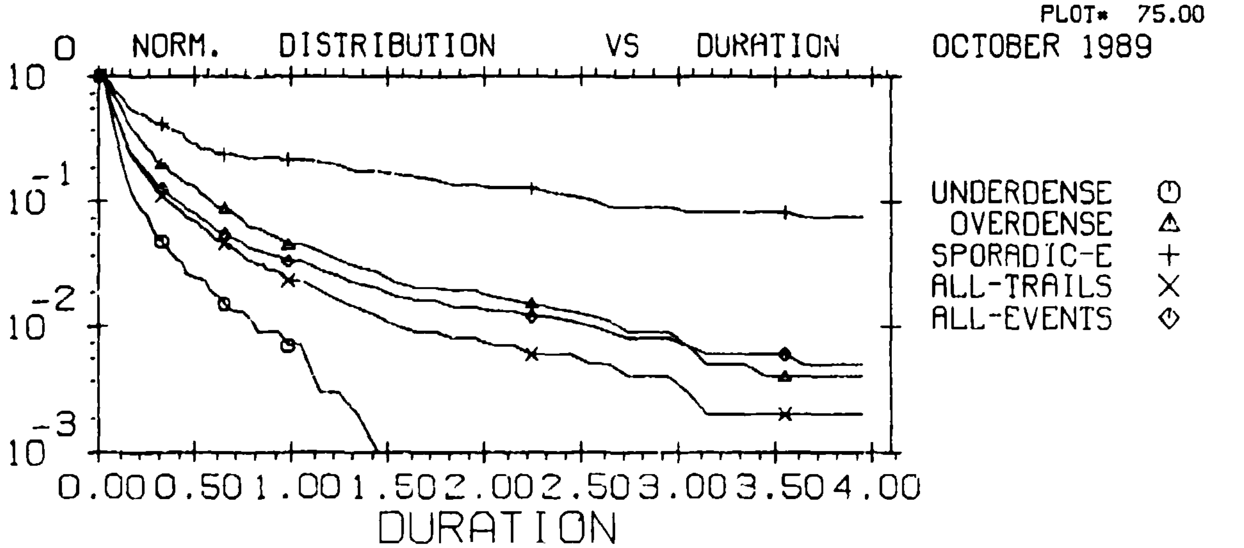
MENU=106,02-4
13-MAY-93
PLOT= 7[illegible].00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 2610. OVER - 1743. SPOR-E - 439.
TRAILS - 4353. EVENTS - 4792.

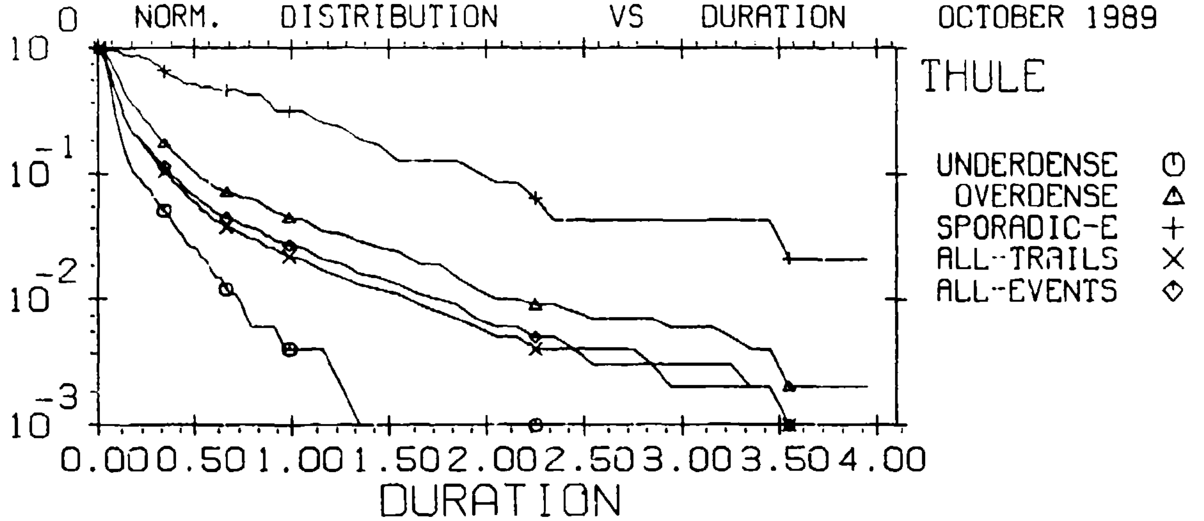
MENU*106,02-4
13-MAY-93
PLOT* 75.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1511. OVER - 1134. SPOR-E - 134.
TRAILS - 2645. EVENTS - 2779.

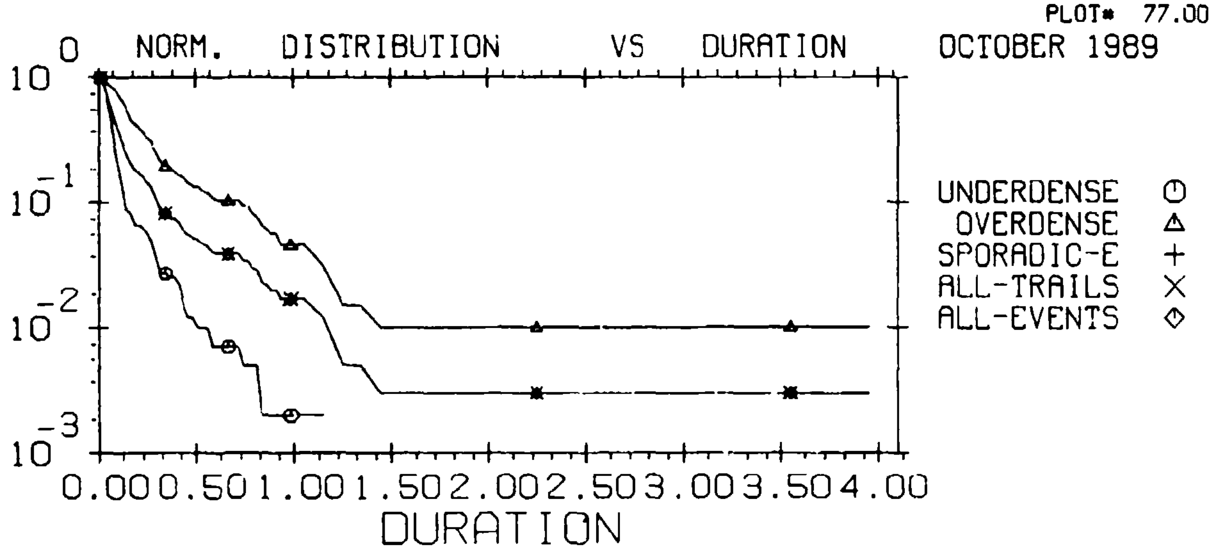
MENU*106,02-4
13-MAY-93
PLOT* 76.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1613. OVER - 1227. SPOR-E - 47.
TRAILS - 2840. EVENTS - 2887.

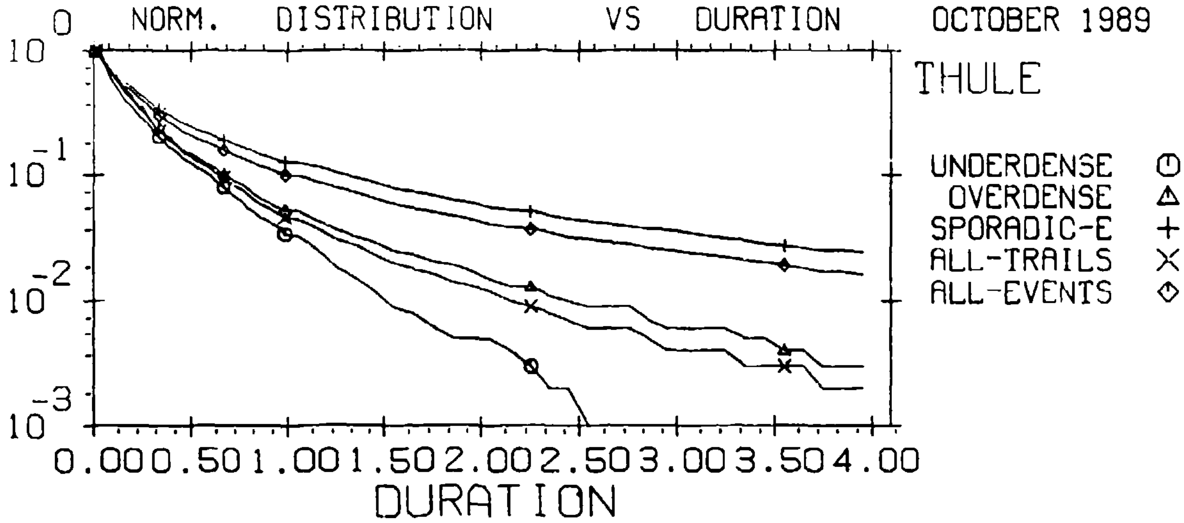
MENU#106,02-4
13-MAY-93
PLOT# 77.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 402. OVER - 194. SPOR-E - 0.
TRAILS - 596. EVENTS - 596.

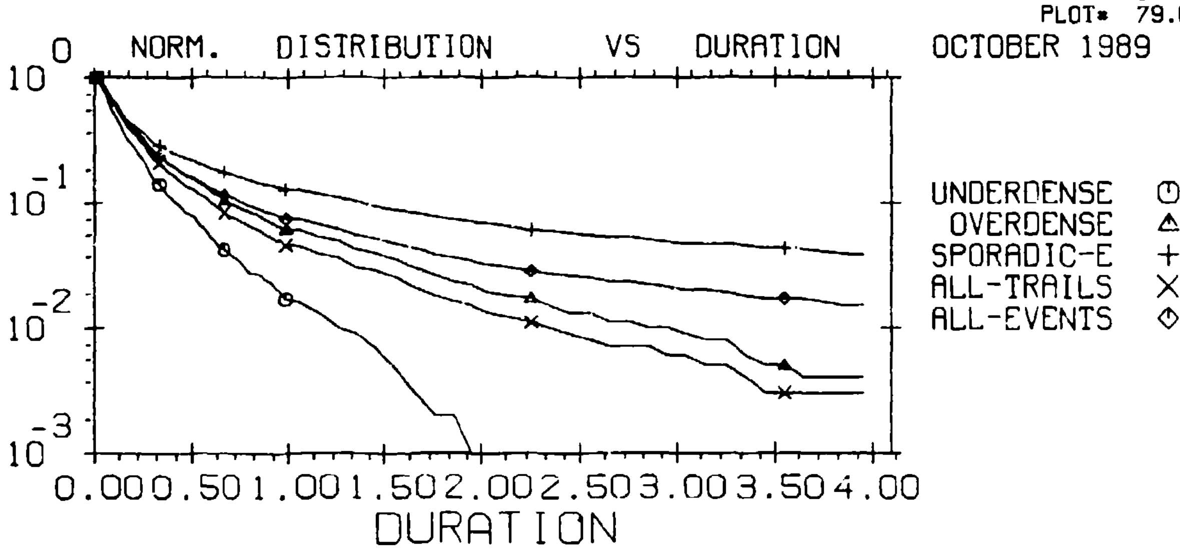
MENU#106,02-4
13-MAY-93
PLOT# 78.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 2599. OVER - 5144. SPOR-E - 15161.
TRAILS - 7743. EVENTS - 22904.

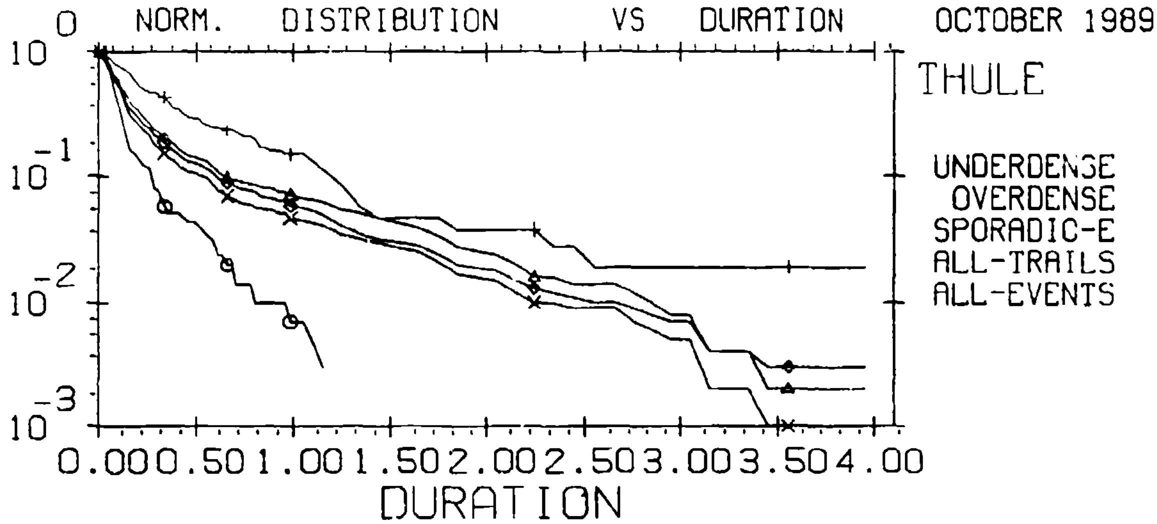
MENU*106,02-4
13-MAY-93
PLOT* 79.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 1644. OVER - 3113. SPOR-E - 2561.
TRAILS - 4757. EVENTS - 7318.

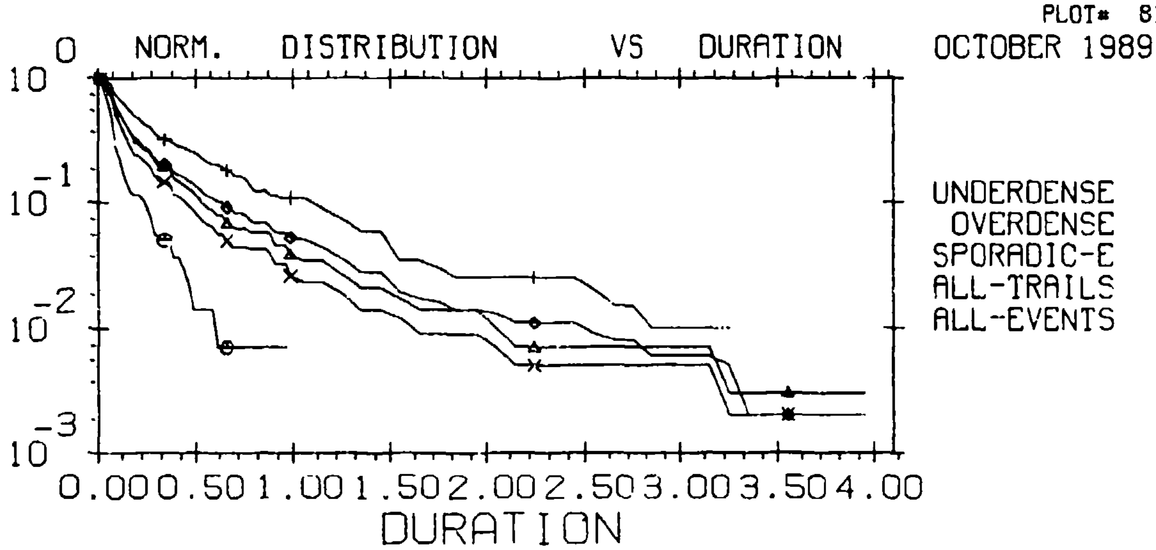
MENU*106,02-4
13-MAY-93
PLOT* 80.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 295. OVER - 507. SPOR-E - 106.
TRAILS - 802. EVENTS - 908.

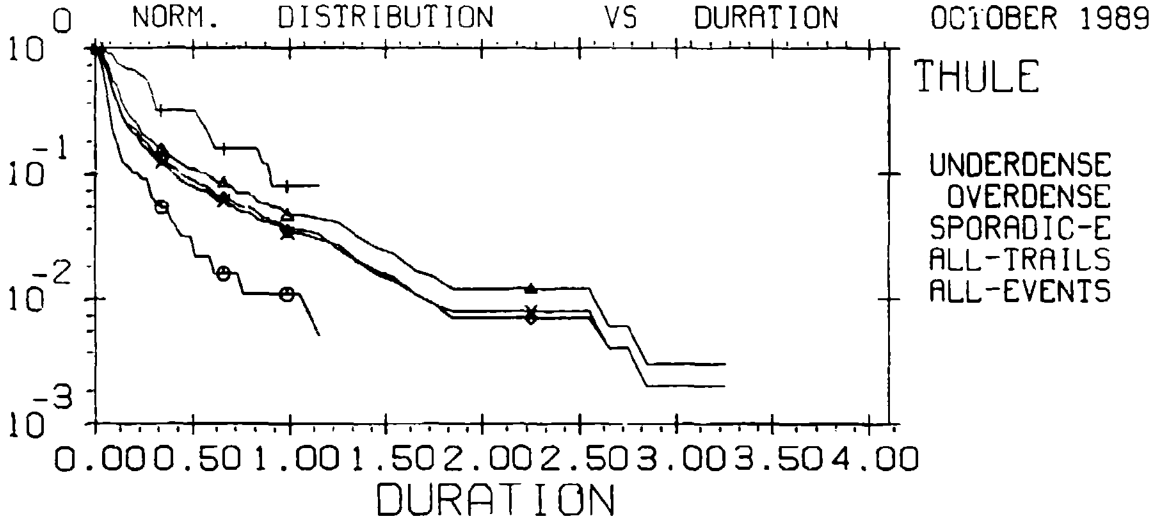
MENU*106,02-4
13-MAY-93
PLOT* 81.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 139. OVER - 292. SPOR-E - 203.
TRAILS - 431. EVENTS - 634.

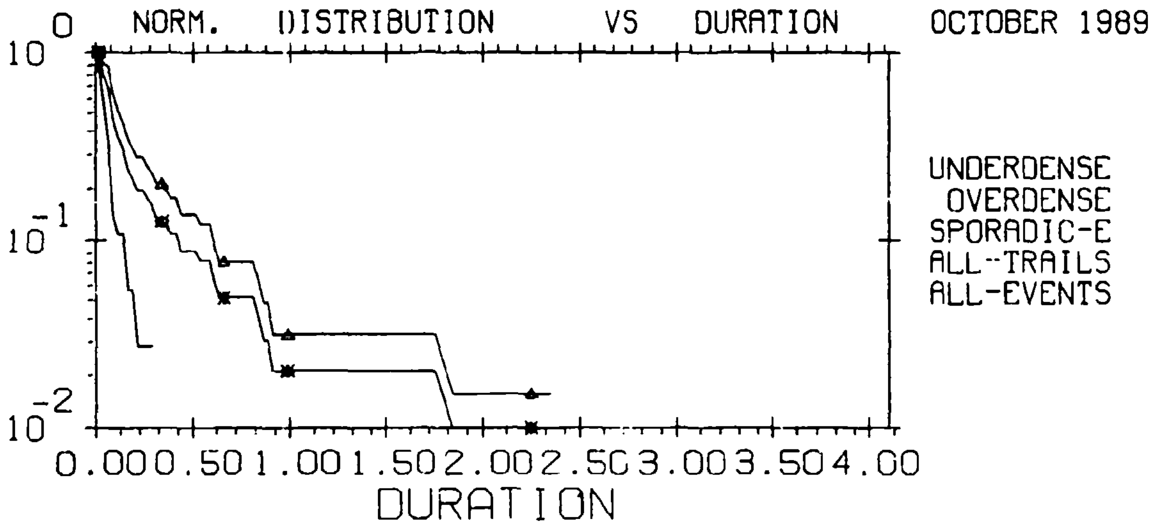
MENU*106,02-4
13-MAY-93
PLOT* 82.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 185. OVER - 343. SPOR-E - 25.
TRAILS - 528. EVENTS - 553.

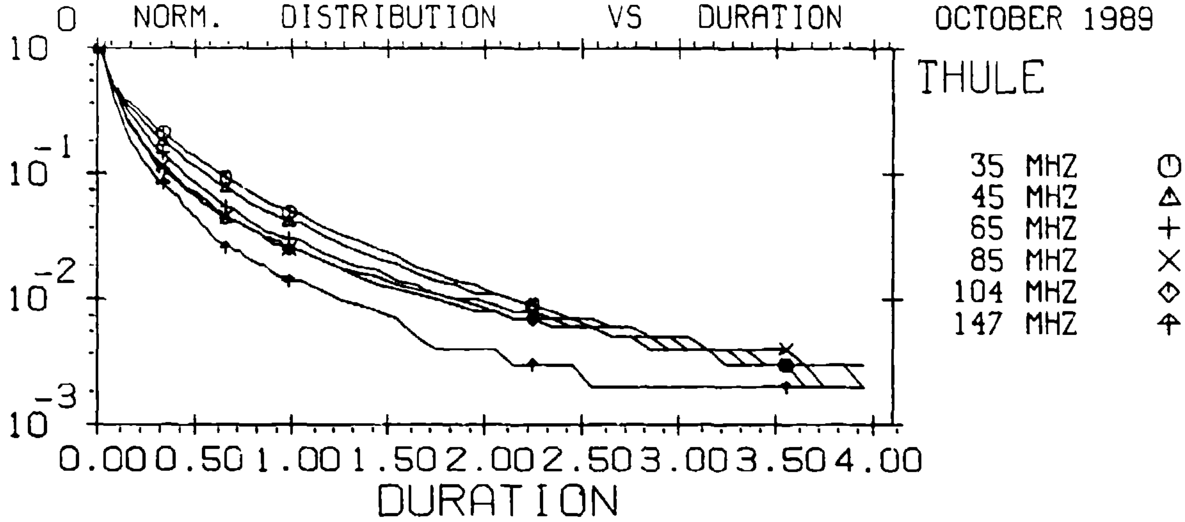
MENU*106,02-4
13-MAY-93
PLOT* 83.00




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
UNDER - 37. OVER - 65. SPOR-E - 0.
TRAILS - 102. EVENTS - 102.

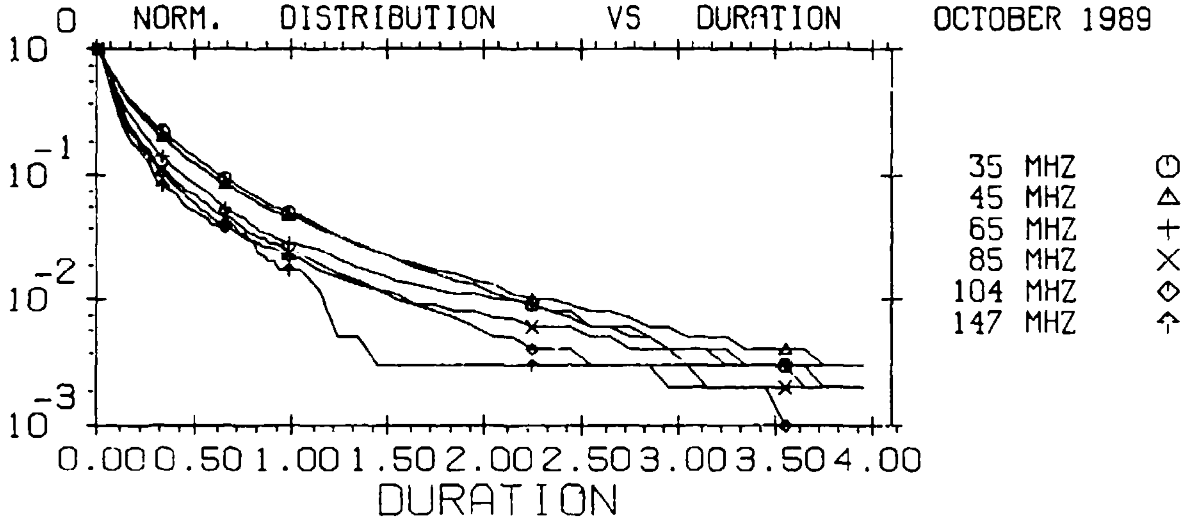
MENU*106,02-4
13-MAY-93
PLOT* 84.00

## GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -126.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 86380. 45MHZ - 55287. 65MHZ - 12033.
85MHZ - 7368. 104MHZ - 7704. 147MHZ - 1825.

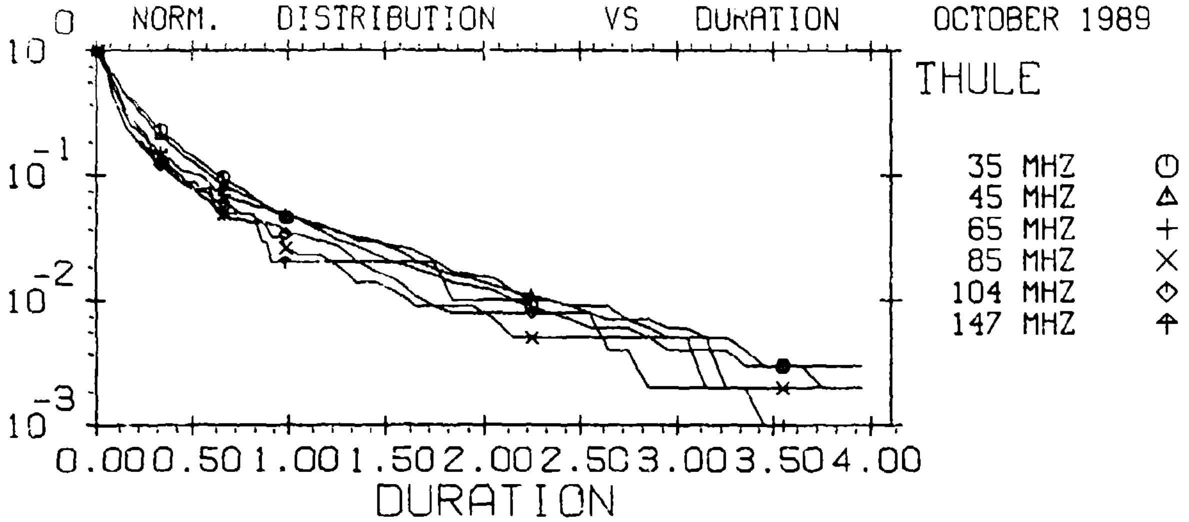
MENU*106,01-4
13-MAY-93
PLOT* 85.00




EXCEEDING -116.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 35517. 45MHZ - 19993. 65MHZ - 4353.
85MHZ - 2645. 104MHZ - 2840. 147MHZ - 596.

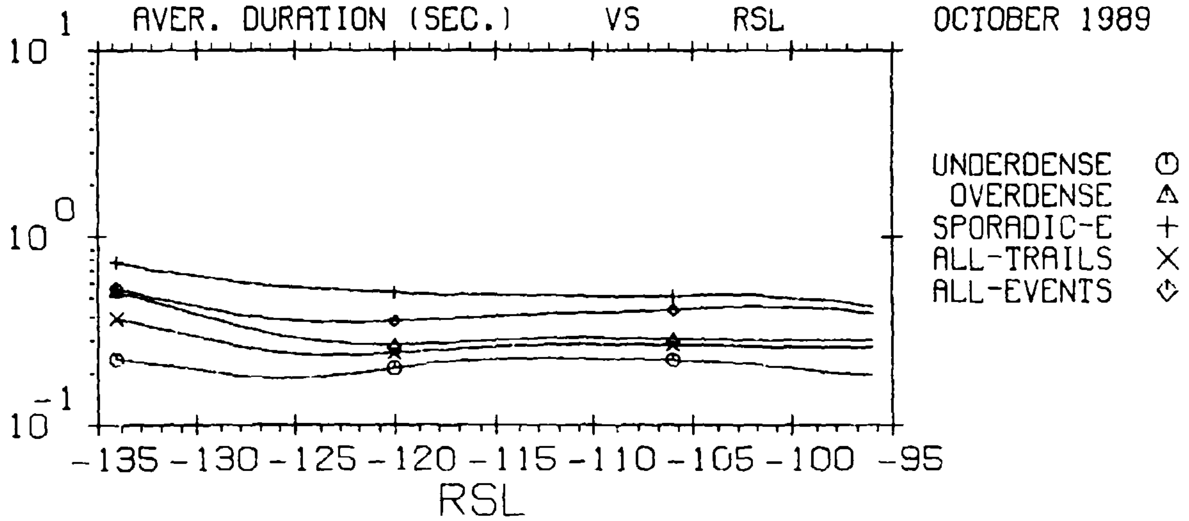
MENU*106,01-4
13-MAY-93
PLOT* 86.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING -106.0 DBM RSL
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 7743. 45MHZ - 4757. 65MHZ - 802.
85MHZ - 431. 104MHZ - 528. 147MHZ - 102.

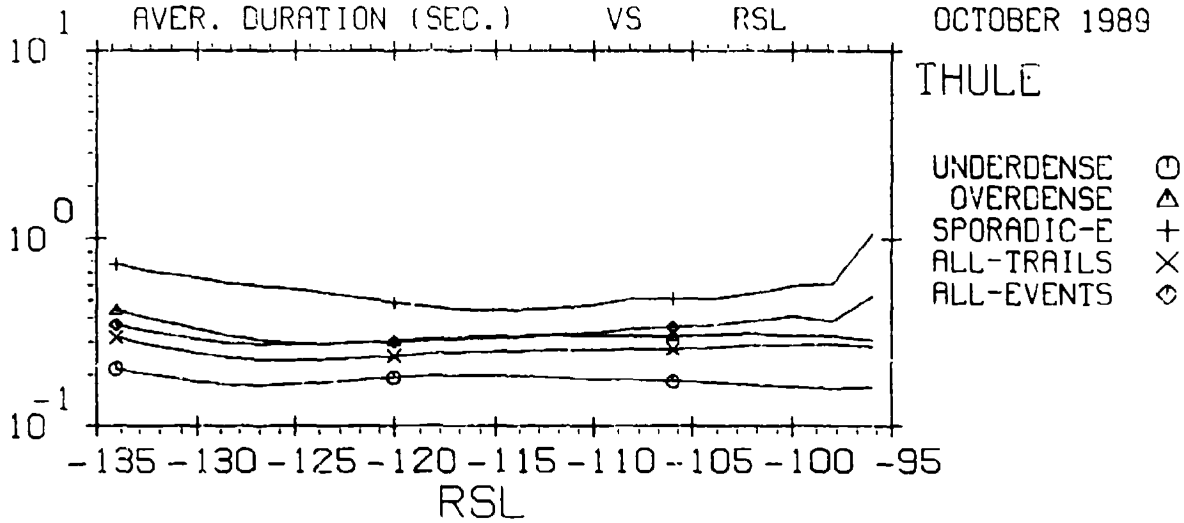
MENU#106,01-4
13-MAY-93
PLOT# 87.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 35 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

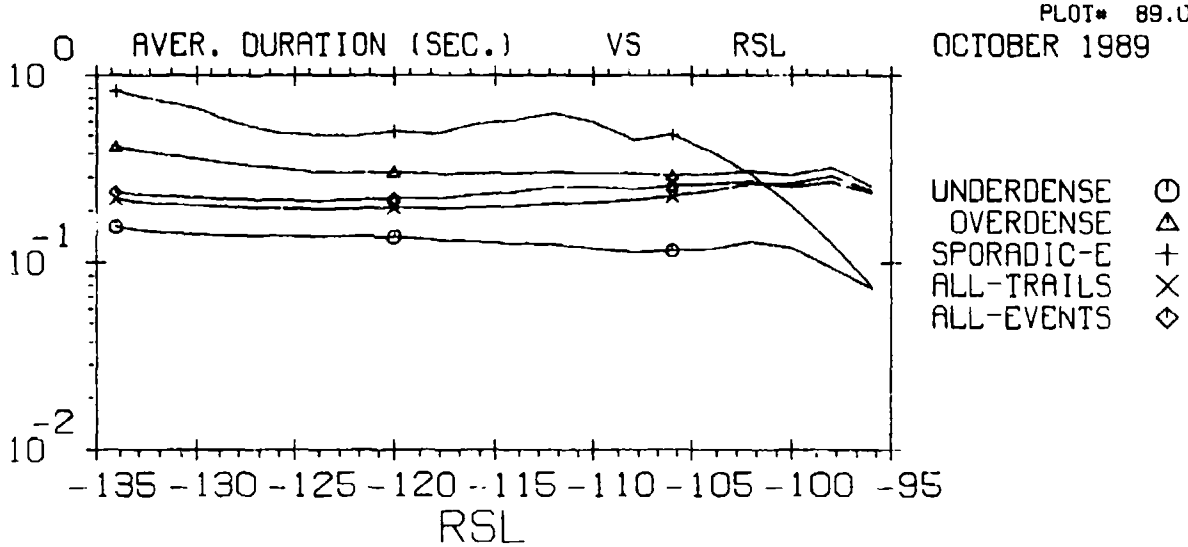
MENU#106,06-1
13-MAY-93
PLOT# 88.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 45 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

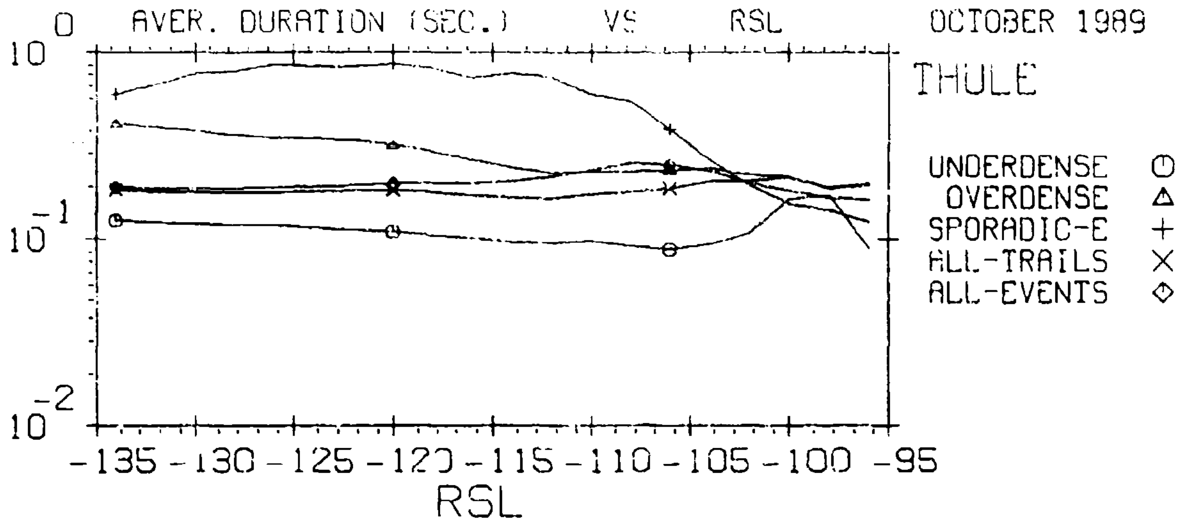
MENU*106,06-1
13-MAY-93
PLOT* 89.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 65 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

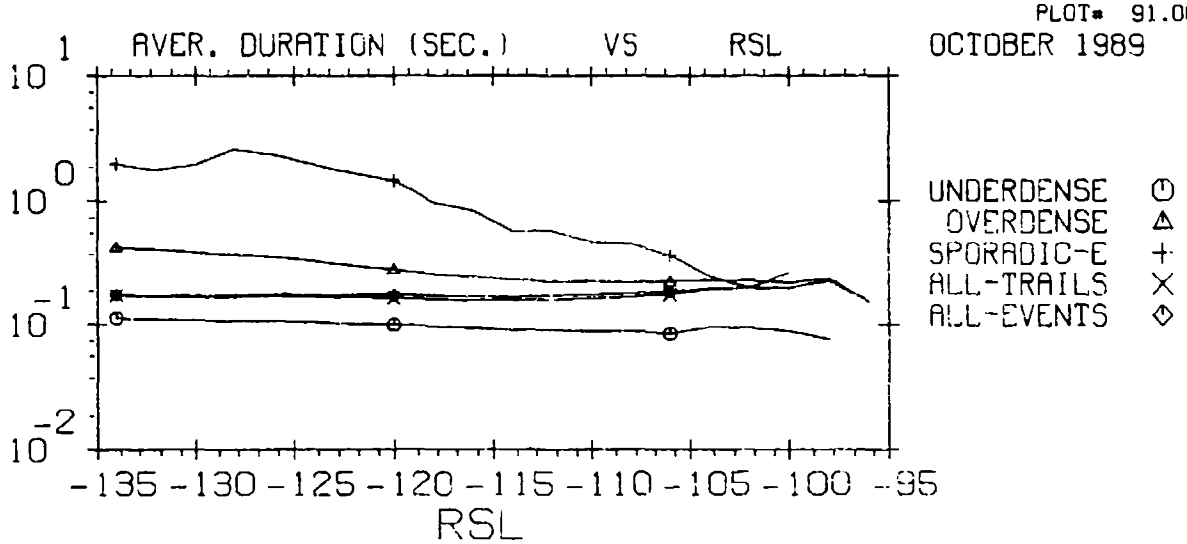
MENU*106,06-1
13-MAY-93
PLOT* 90.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 85 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

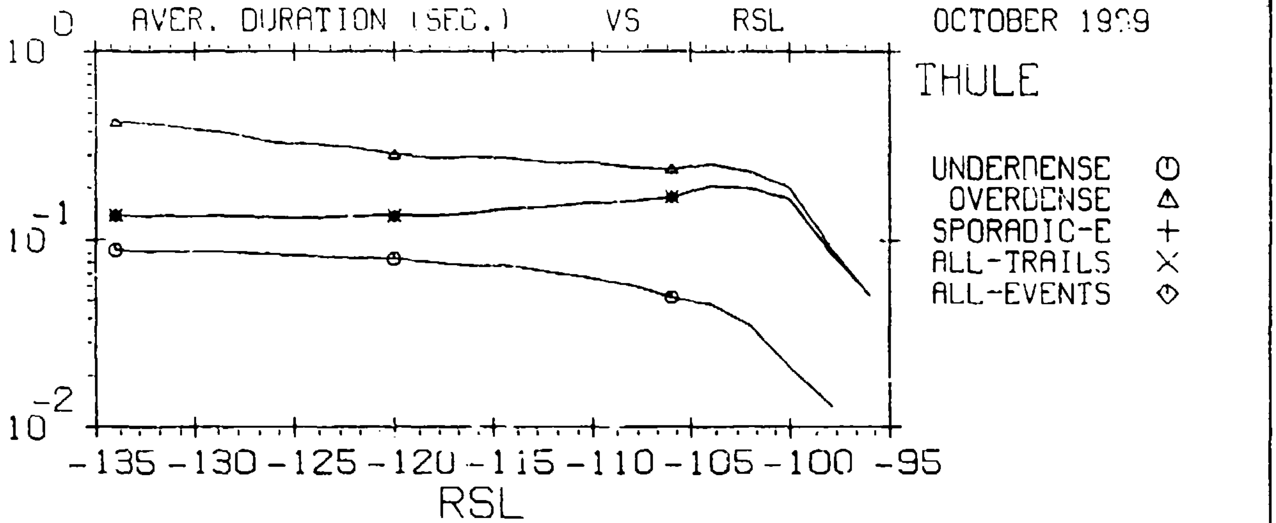
MENU*106,06-1
13-MAY-93
PLOT* 91.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 104 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

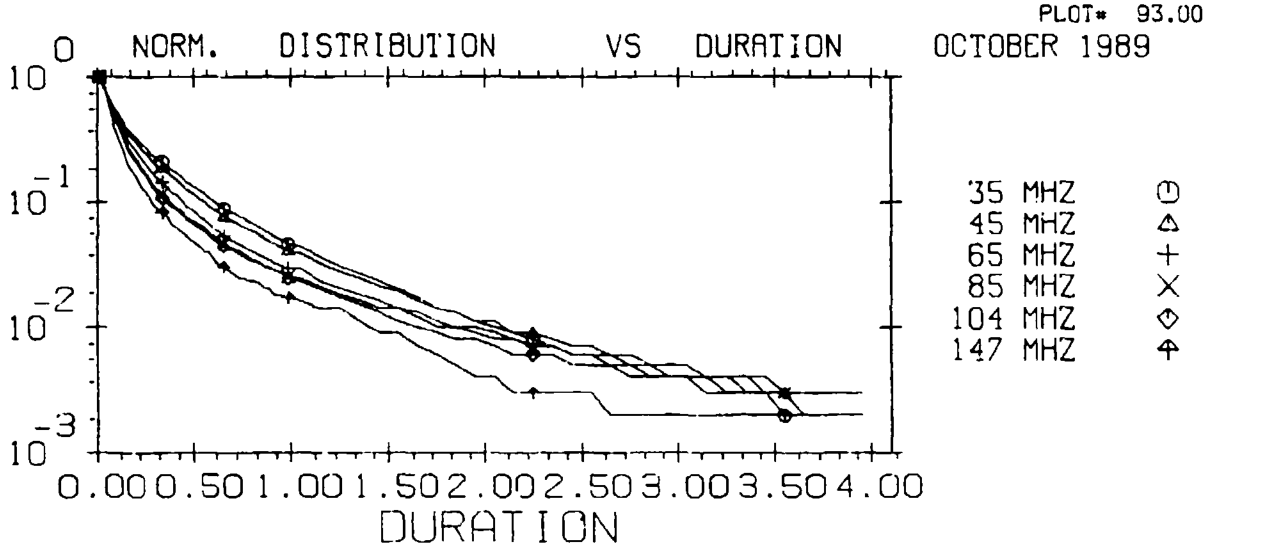
MENU*106,06-1
13-MAY-93
PLOT* 92.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
FREQUENCY - 147 MHZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

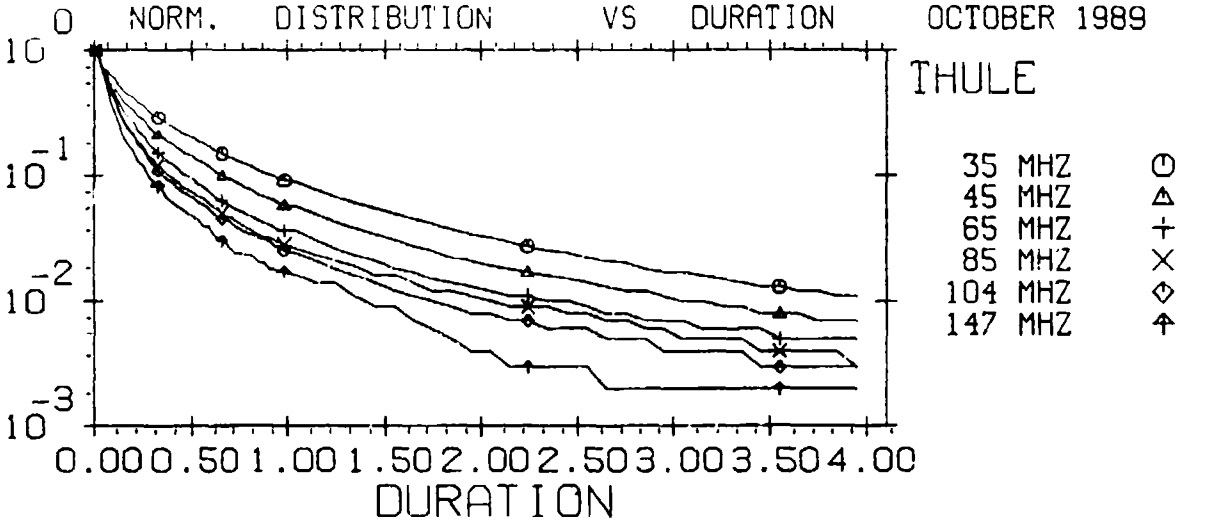
MENU*106,06-1
13-MAY-93
PLOT* 93.00




EXCEEDING 19.0 DB SNR
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH = 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 67290. 45MHZ - 46981. 65MHZ - 12007.
85MHZ - 8742. 104MHZ - 9648. 147MHZ - 2357.

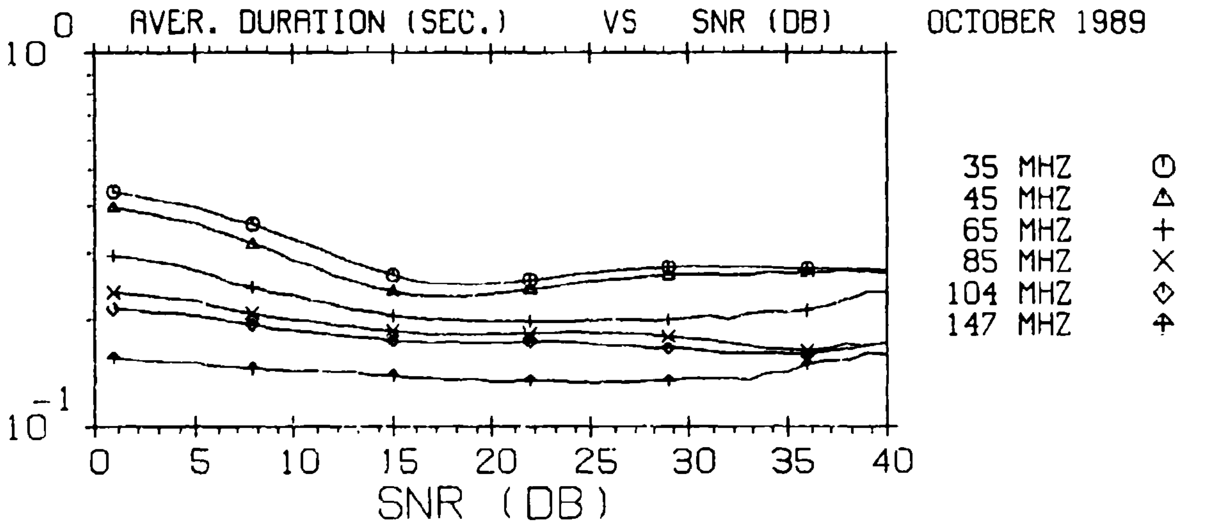
MENU*107,01-4
13-MAY-93
PLOT* 94.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




EXCEEDING 19.0 DB SNR
THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ - 118147. 45MHZ - 56772. 65MHZ - 12872.
85MHZ - 8859. 104MHZ - 9664. 147MHZ - 2357.

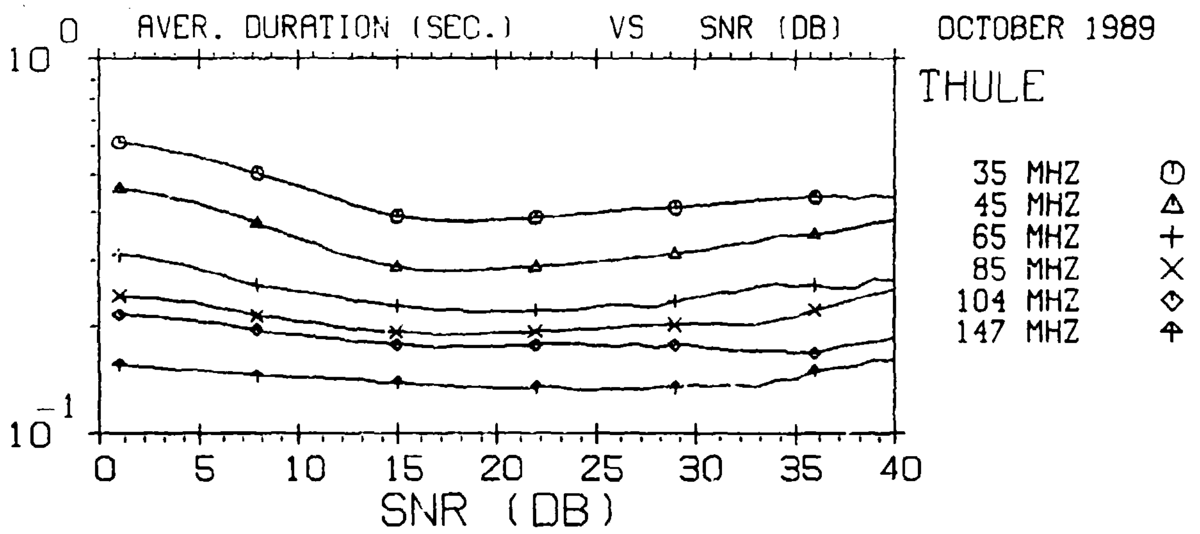
MENU*107,01-4
13-MAY-93
PLOT* 95.00




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

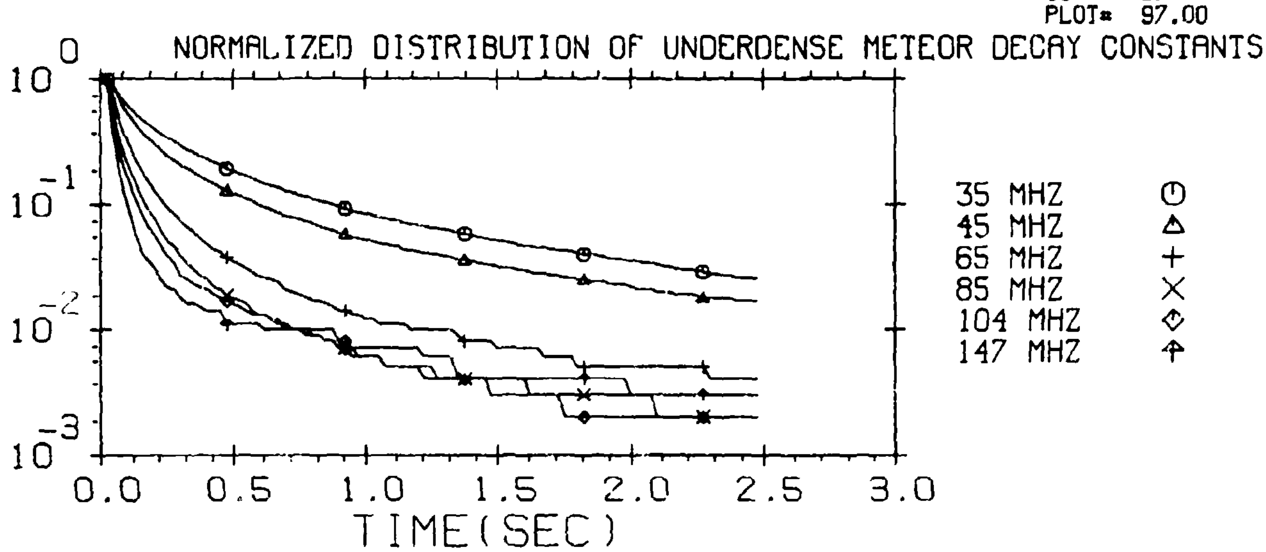
MENU*107,05-1
13-MAY-93
PLOT* 96.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 - 24 HOURS U.T.
THE EVENT CLASS IS SPORADIC-E AND METEOR TRAILS
EFFECTIVE SYSTEM BANDWIDTH - 100.HZ
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL

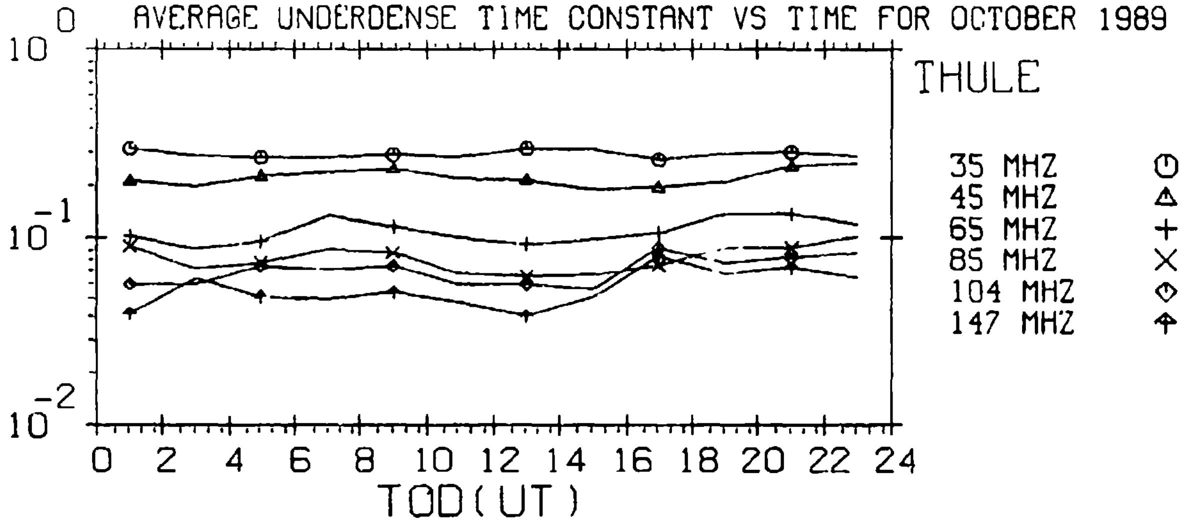
MENU*10: ,05-1
13-MAY-93
PLOT* 97.00




OCTOBER 1989
THE TIME OF DAY IS 0 : 24 HOURS U.T.
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
NORMALIZING FACTORS:
35MHZ : 19619. 45MHZ : 19510. 65MHZ : 9742.
85MHZ : 7186. 104MHZ : 7913. 147MHZ : 1786.

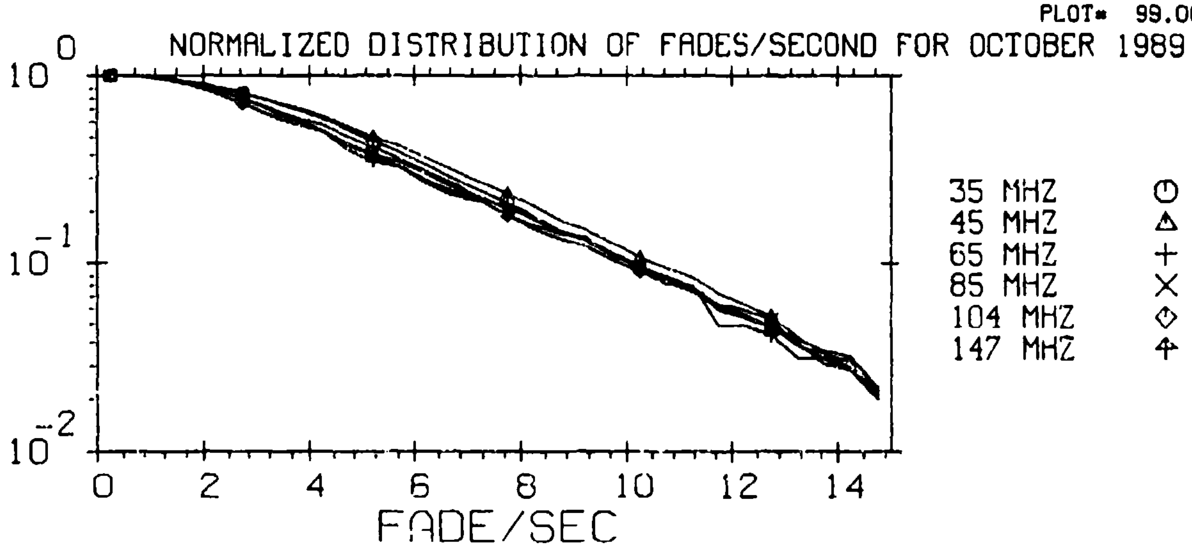
MENU*108,01-4
13-MAY-93
PLOT* 98.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
THE 24 HOUR AVERAGE TIME CONSTANTS ARE
0.277 0.209 0.107 0.077 0.066 0.053

MENU=108,02-1
13-MAY-93
PLOT= 99.00

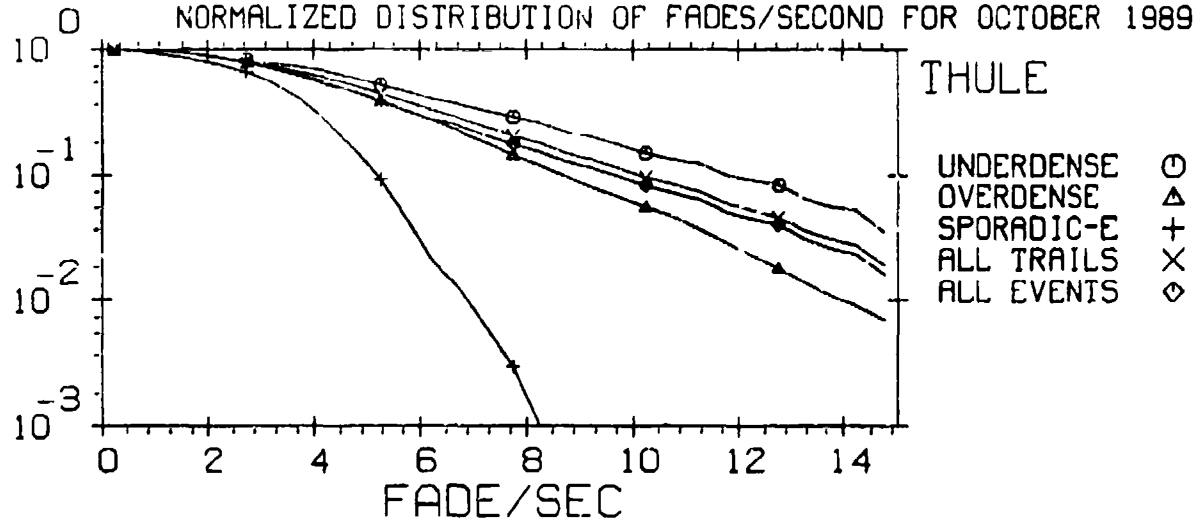



THE TIME OF DAY IS 0 : 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
NORMALIZING FACTORS:
35MHZ : 23519. 45MHZ : 17570. 65MHZ : 3306.
85MHZ : 1648. 104MHZ : 1366. 147MHZ : 195.

MENU=109,01-4
13-MAY-93
PLOT= 100.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM

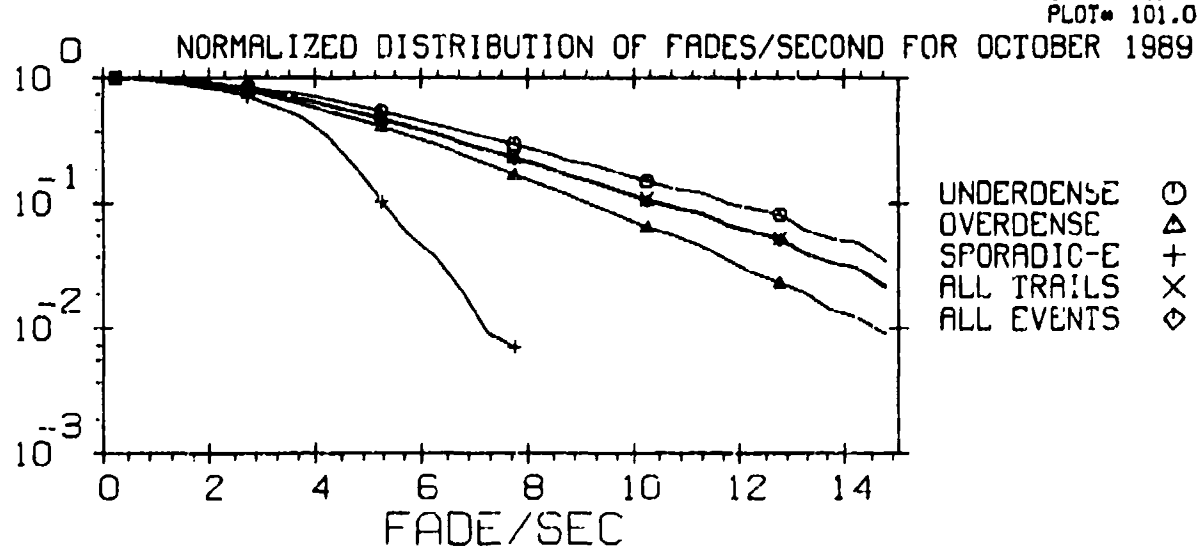
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR OCTOBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 35 MHZ
NORMALIZING FACTORS:
UNDER : 10070. OVER : 13479. SPOR-E : 4019.
TRAILS : 23549. EVENTS : 27568.

MENU# 109,02-4
13-MAY-93
PLOT# 101.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR OCTOBER 1989

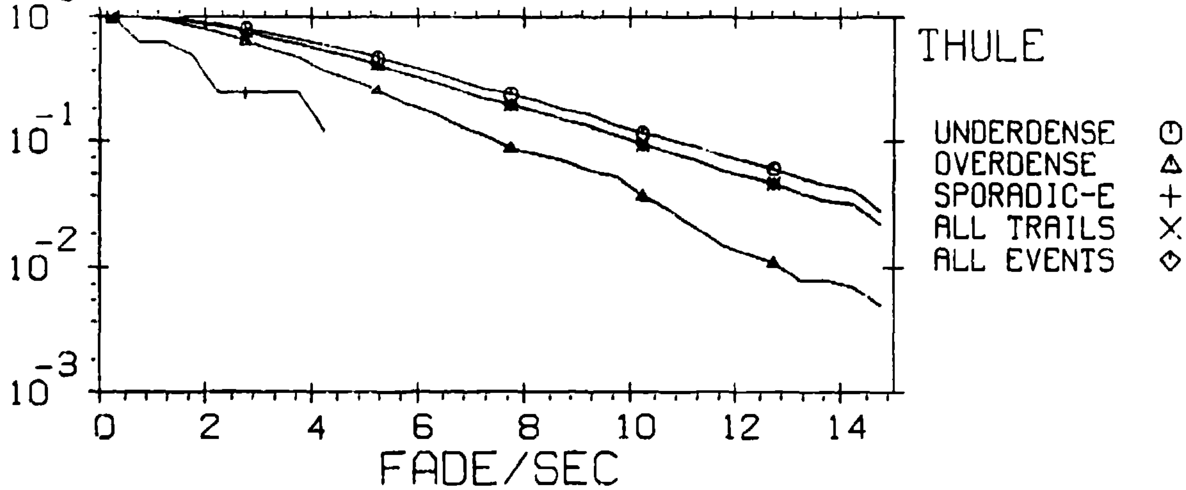



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 45 MHZ
NORMALIZING FACTORS:
UNDER : 8936. OVER : 8634. SPOR-E : 458.
TRAILS : 17570. EVENTS : 18028.

MENU# 109,02-4
13-MAY-93
PLOT# 102.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

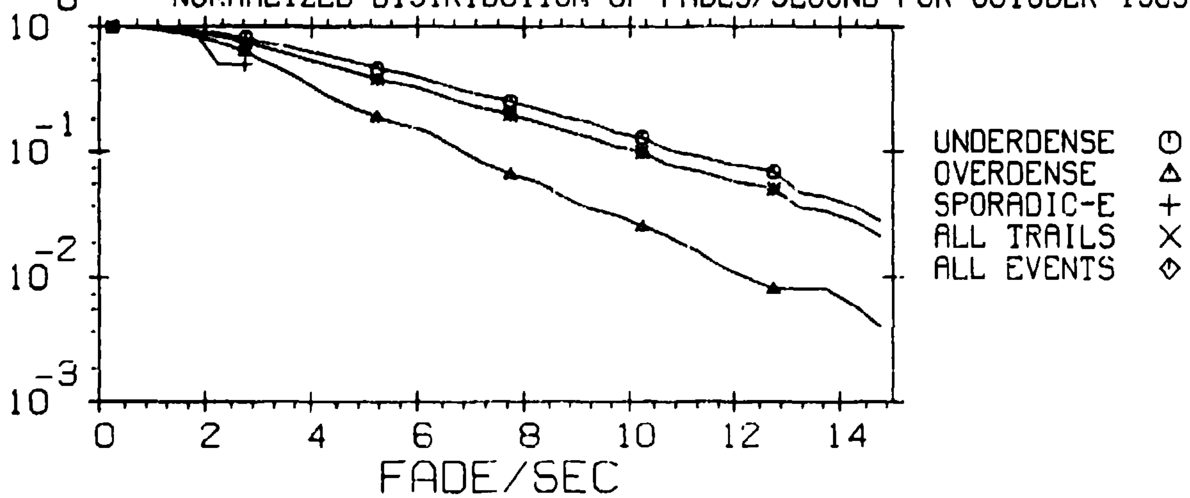
NORMALIZED DISTRIBUTION OF FADES/SECOND FUR OCTOBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 65 MHZ
NORMALIZING FACTORS:
UNDER : 2364. OVER : 942. SPOR-E : 8.
TRAILS : 3306. EVENTS : 3314.

MENU* 109,02-4
13-MAY-93
PLOT* 103.00

NORMALIZED DISTRIBUTION OF FADES/SECOND FOR OCTOBER 1989

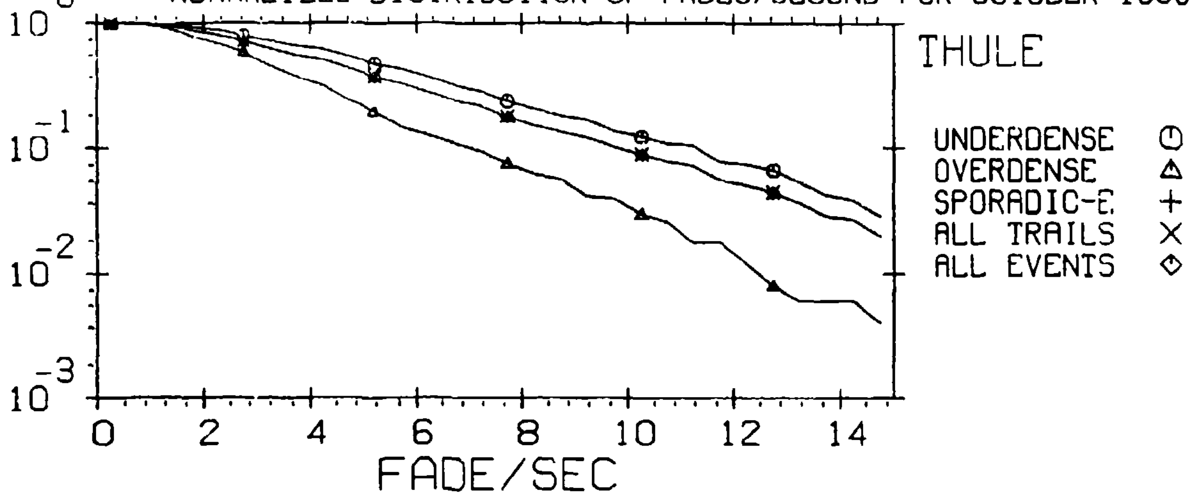



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 85 MHZ
NORMALIZING FACTORS:
UNDER : 1163. OVER : 485. SPOR-E : 2.
TRAILS : 1648. EVENTS : 1650.

MENU* 109,02-4
13-MAY-93
PLOT* 104.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

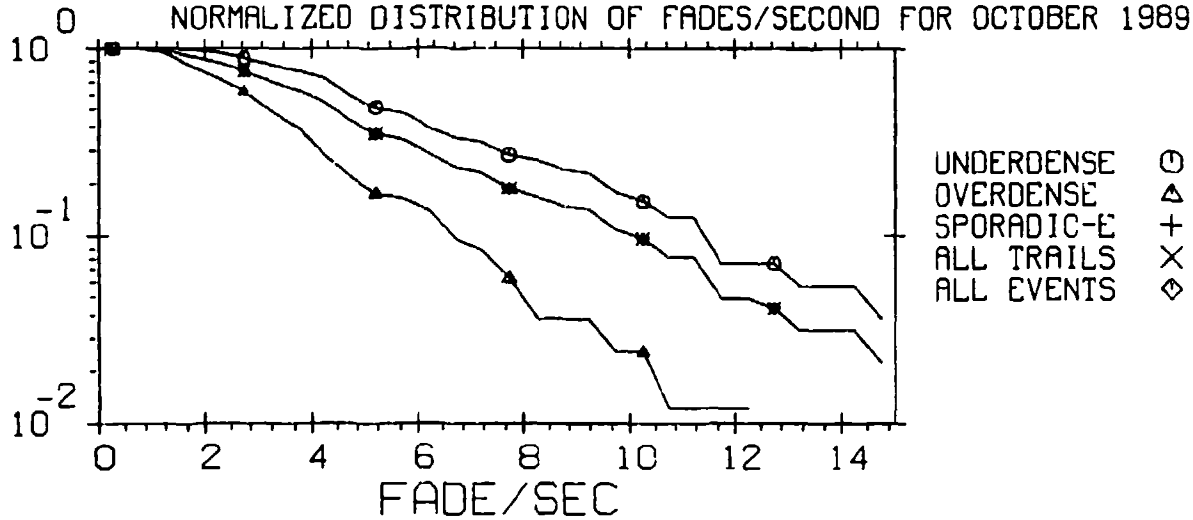
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR OCTOBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 104 MHZ
NORMALIZING FACTORS:
UNDER : 868. OVER : 498. SPOR-E : 1.
TRAILS : 1366. EVENTS : 1366.

MENU# 109,02-4
13-MAY-93
PLOT# 105.00

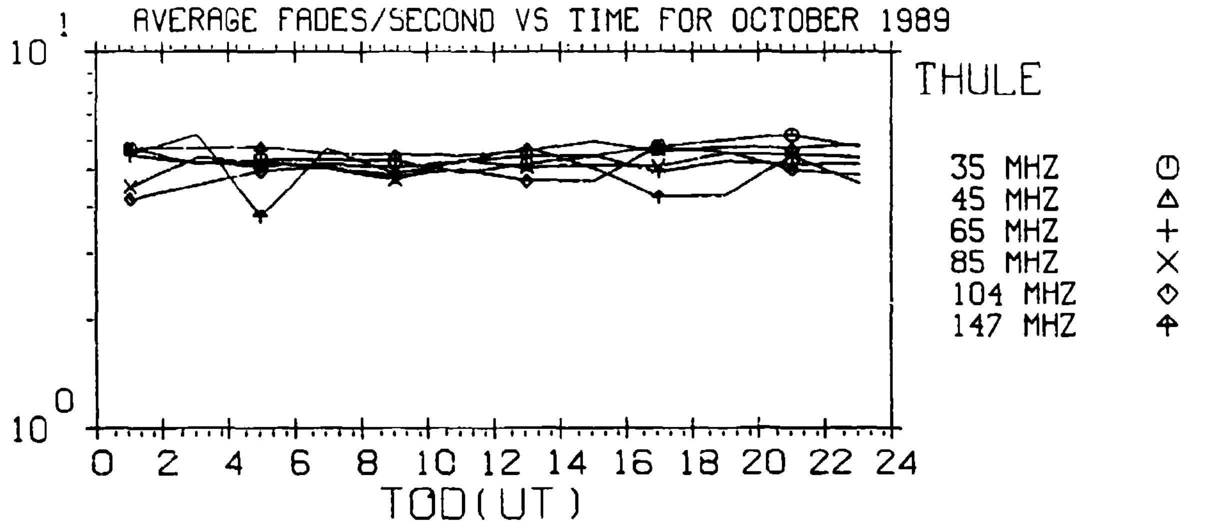
NORMALIZED DISTRIBUTION OF FADES/SECOND FOR OCTOBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 147 MHZ
NORMALIZING FACTORS:
UNDER : 112. OVER : 83. SPOR-E : 1.
TRAILS : 195. EVENTS : 195.

MENU# 109,02-4
13-MAY-93
PLOT# 106.00

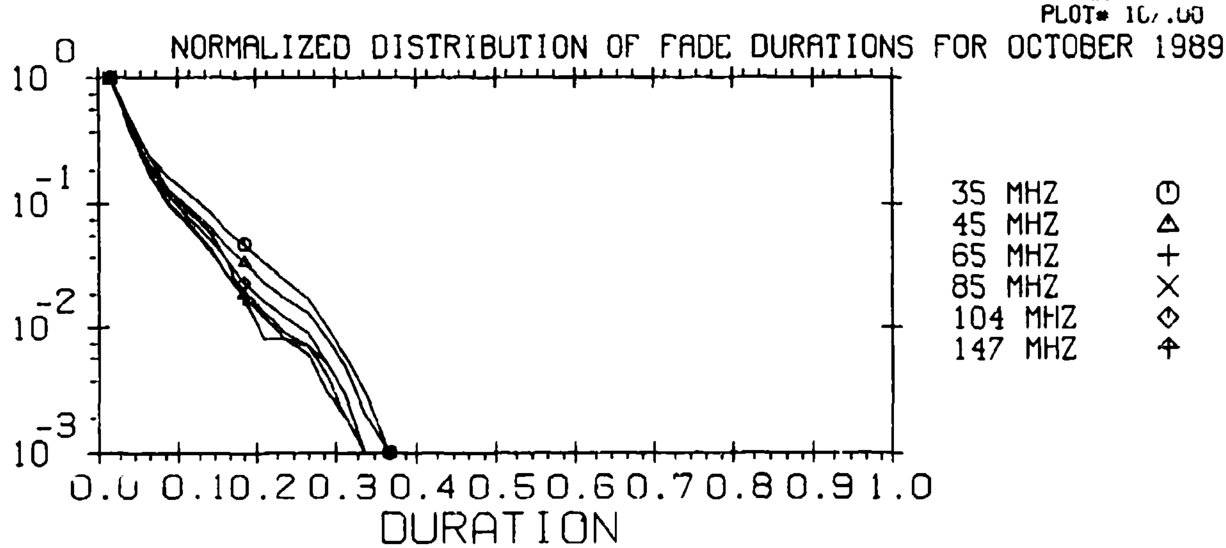
# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
THE 24 HOUR FADES/SECOND AVERAGES ARE:

| | | | | | |
|---|---|---|---|---|---|
| 5.299 | 5.491 | 5.082 | 4.988 | 4.801 | 4.888 |

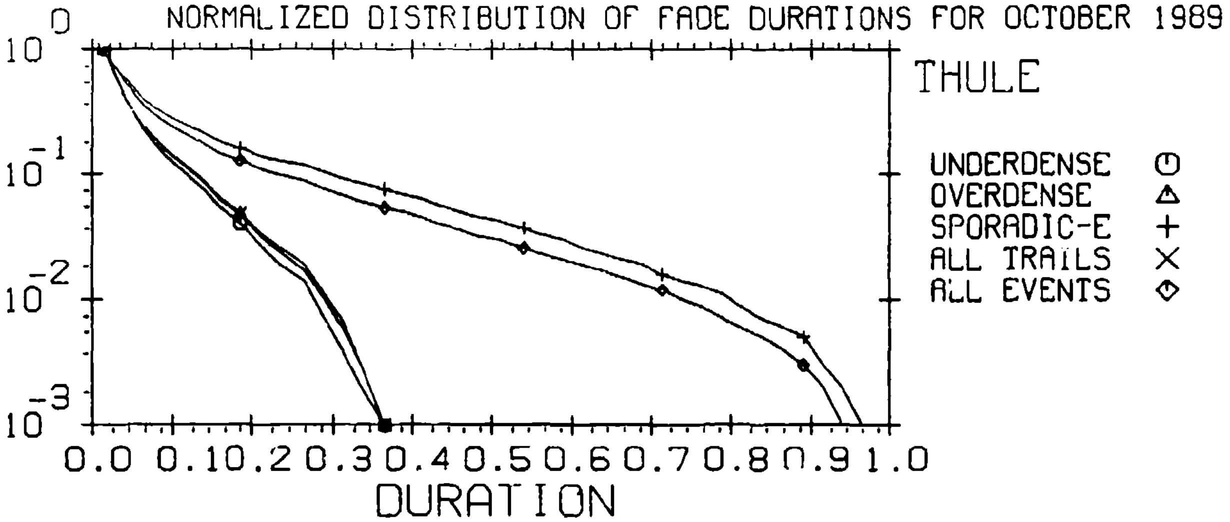
MENU*1.
13-MAY-.
PLOT* 1(/.00




THE TIME OF DAY IS 0 : 24 HOURS U.T.
THE EVENT CLASS IS UNDERDENSE AND OVERDENSE TRAILS
NORMALIZING FACTORS:
35MHZ : 111262. 45MHZ : 76160. 65MHZ : 11680.
85MHZ : 5551. 104MHZ : 4569. 147MHZ : 600.

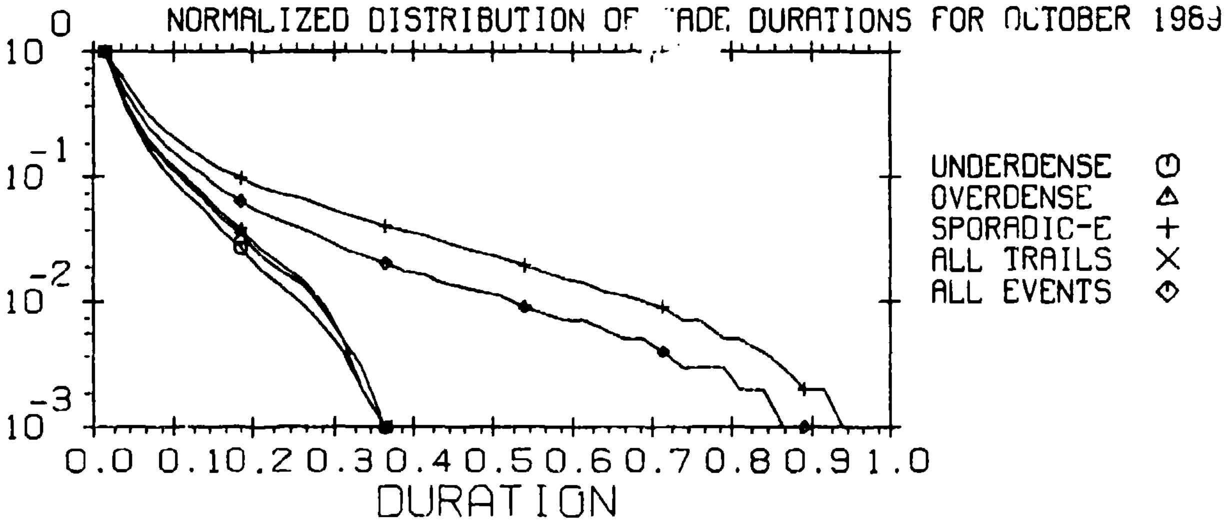
MENU* 09,05-4
13-MAY-93
PLOT* 108.00

# GEOPHYSICS LAB METEOR SCATTER PROGRAM




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 35 MHZ
NORMALIZING FACTORS:
UNDER : 29398. OVER : 81864. SPOR-E : 270624.
TRAILS : 111262. EVENTS : 381886.

MENU*109,06-4
13-MAY-93
PLOT* 109.00

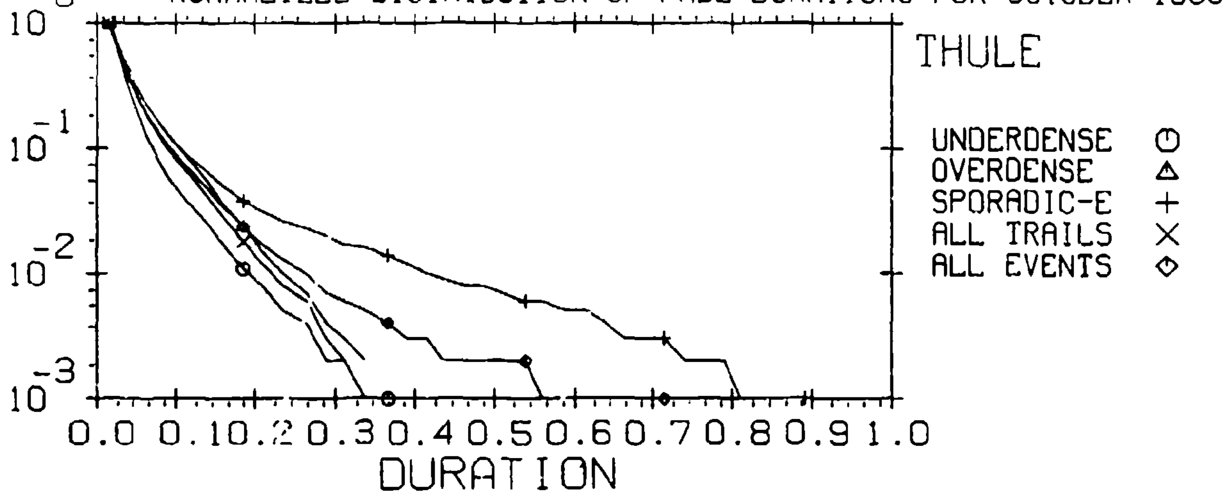



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 45 MHZ
NORMALIZING FACTORS:
UNDER : 24180. OVER : 51980. SPOR-E : 68986.
TRAILS : 76160. EVENTS : 145146.

MENU*109,06-4
13-MAY-93
PLOT* 110.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

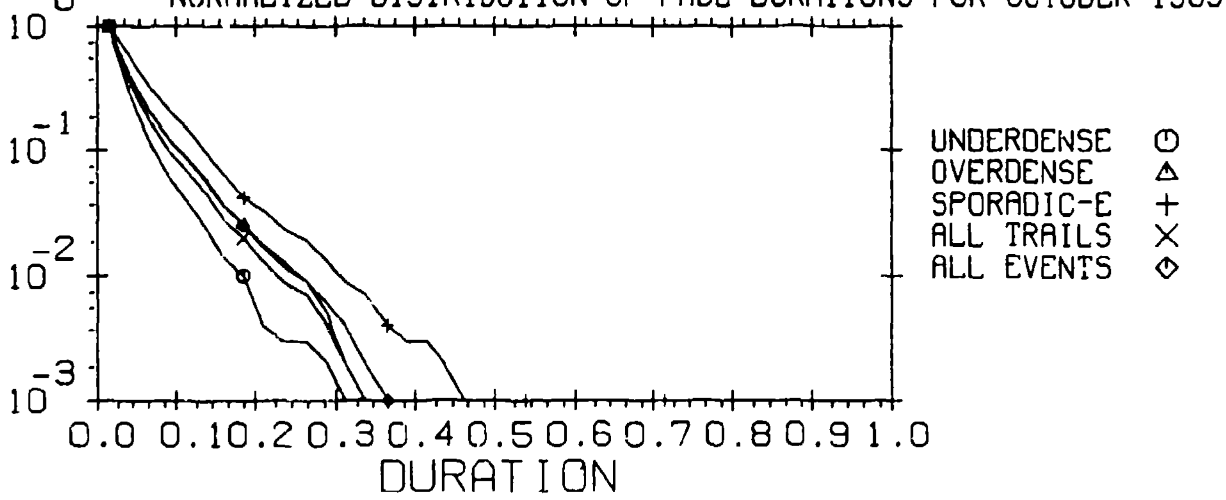
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR OCTOBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 65 MHZ
NORMALIZING FACTORS:
UNDER : 5080. OVER : 6600. SPOR-E : 4170.
TRAILS : 11680. EVENTS : 15850.

MENU*109,06-4
13-MAY-93
PLOT* 111.00

NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR OCTOBER 1989

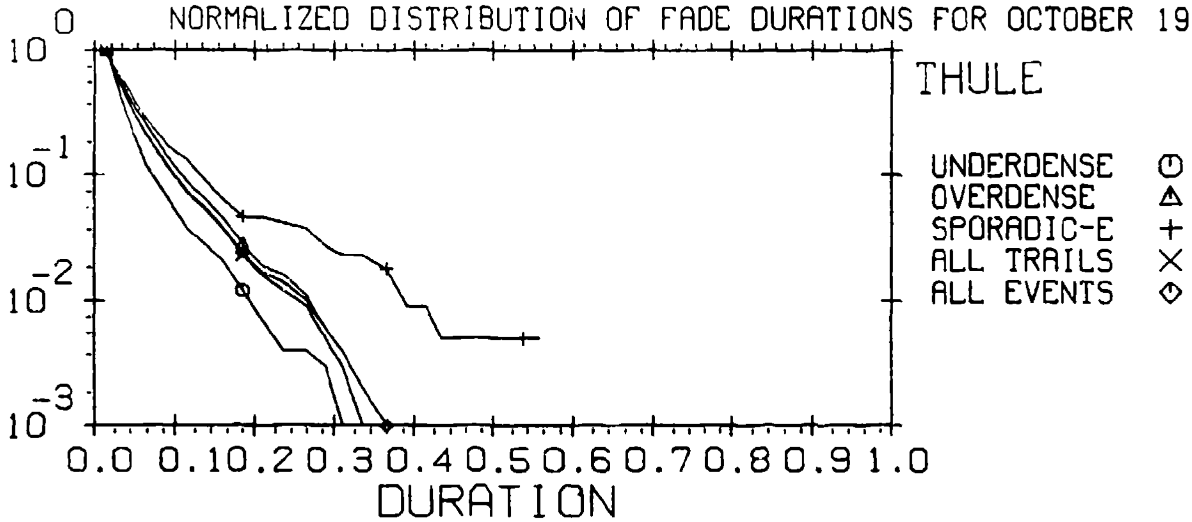



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 85 MHZ
NORMALIZING FACTORS:
UNDER : 2227. OVER : 3324. SPOR-E : 1484.
TRAILS : 5551. EVENTS : 7035.

MENU*109,06-4
13-MAY-93
PLOT* 112.00

GEOPHYSICS LAB METEOR SCATTER PROGRAM

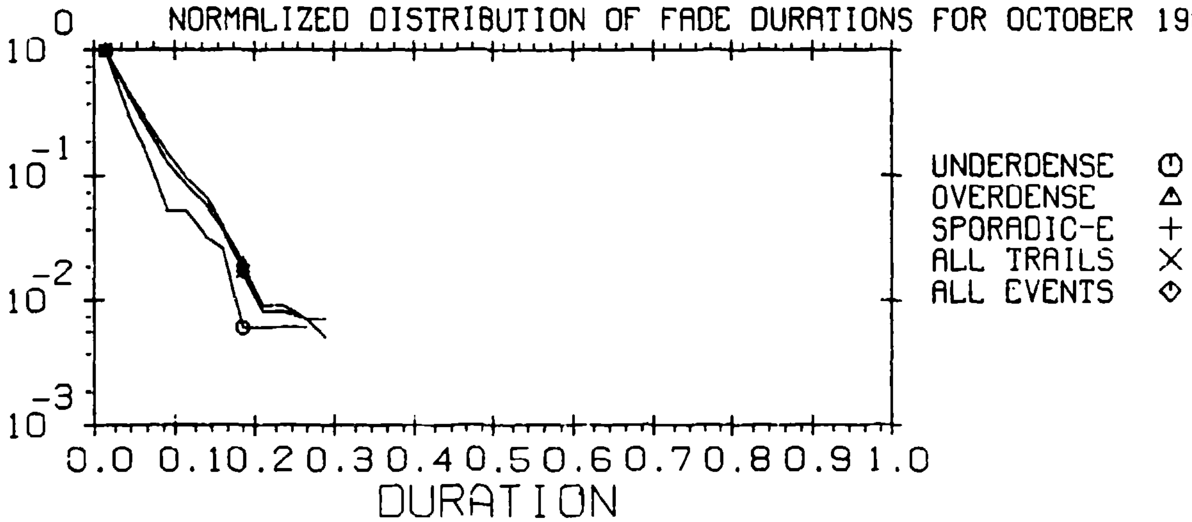
NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR OCTOBER 1989




THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 104 MHZ
NORMALIZING FACTORS:
UNDER : 1433. OVER : 3136. SPOR-E : 219.
TRAILS : 4569. EVENTS : 4788.

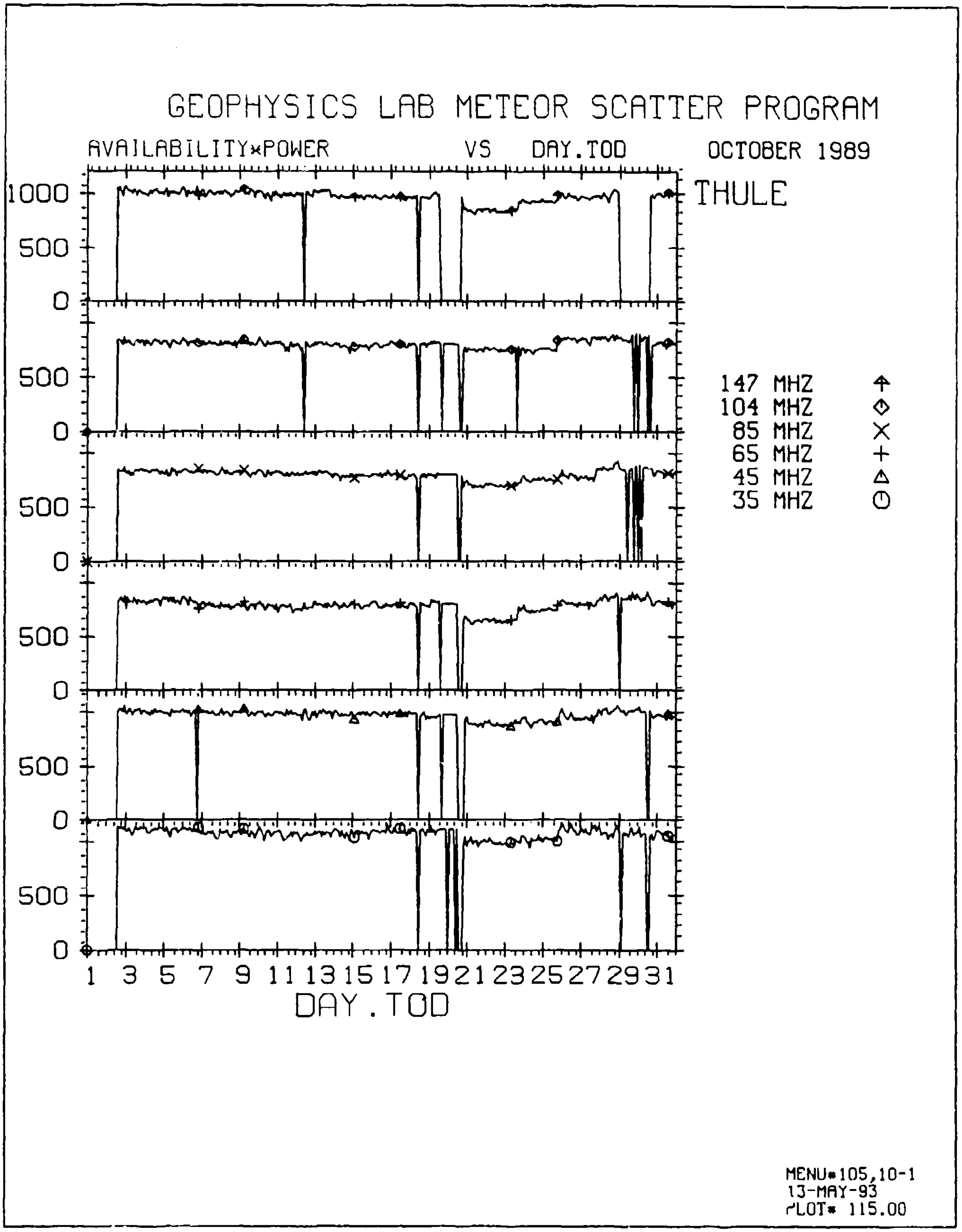
MENU=109,06-4
13-MAY-93
PLOT= 113.00

NORMALIZED DISTRIBUTION OF FADE DURATIONS FOR OCTOBER 1989

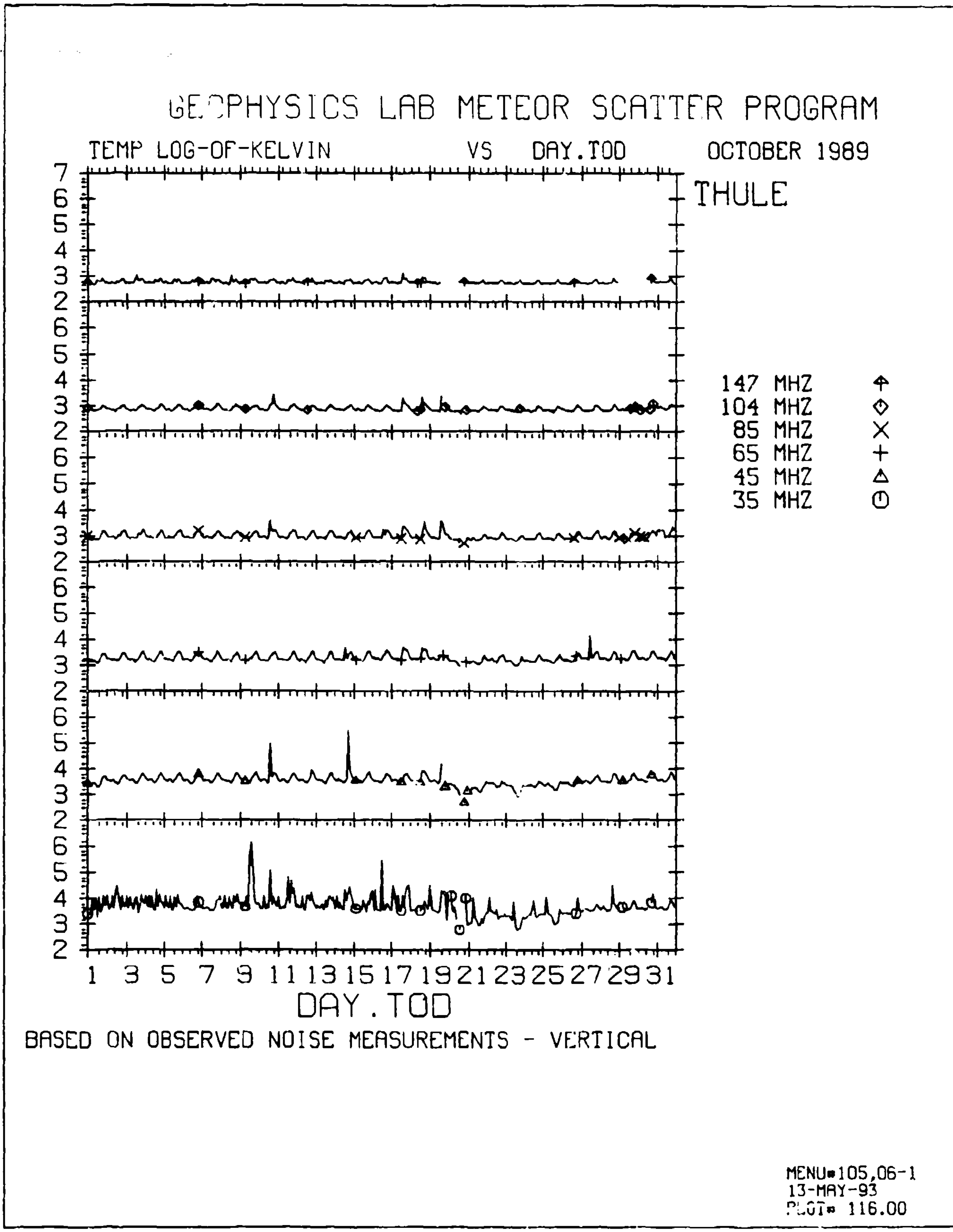



THE TIME OF DAY IS 0 : 24 HOURS U.T.
FREQUENCY - 147 MHZ
NORMALIZING FACTORS:
UNDER : 155. OVER : 445. SPOR-E : 1.
TRAILS : 600. EVENTS : 600.

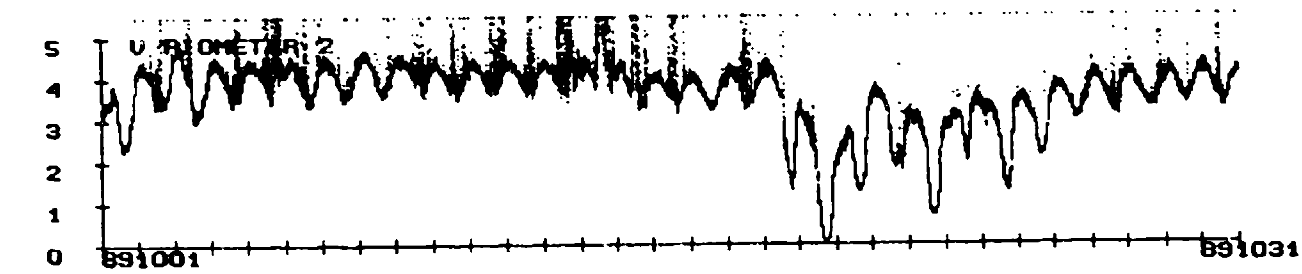
MENU=109,06-4
13-MAY-93
PLOT= 114.00



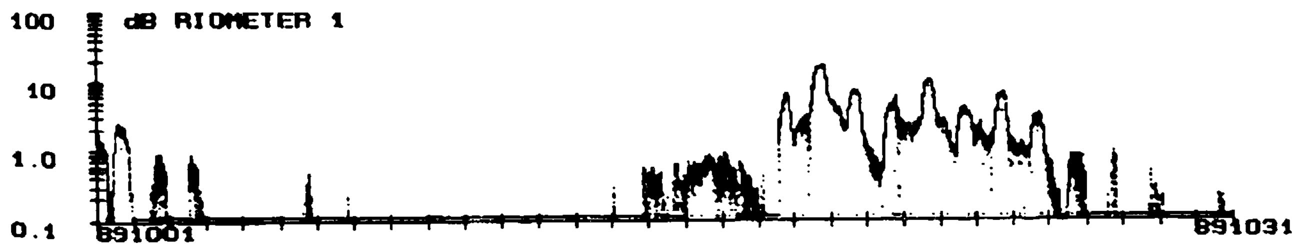
GEOPHYSICS LAB METEOR SCATTER PROGRAM
AVAILABILITY*POWER VS DAY.TOD OCTOBER 1989
THULE
1000
500
0
147 MHZ
104 MHZ
85 MHZ
65 MHZ
45 MHZ
35 MHZ
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
DAY.TOD
MENU* 105,10-1
13-MAY-93
PLOT* 115.00


GEOPHYSICS LAB METEOR SCATTER PROGRAM
TEMP LOG-OF-KELVIN VS DAY.TOD OCTOBER 1989
THULE
147 MHZ
104 MHZ
85 MHZ
65 MHZ
45 MHZ
35 MHZ
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31
DAY.TOD
BASED ON OBSERVED NOISE MEASUREMENTS - VERTICAL
MENU=105,06-1
13-MAY-93
PLOT= 116.00

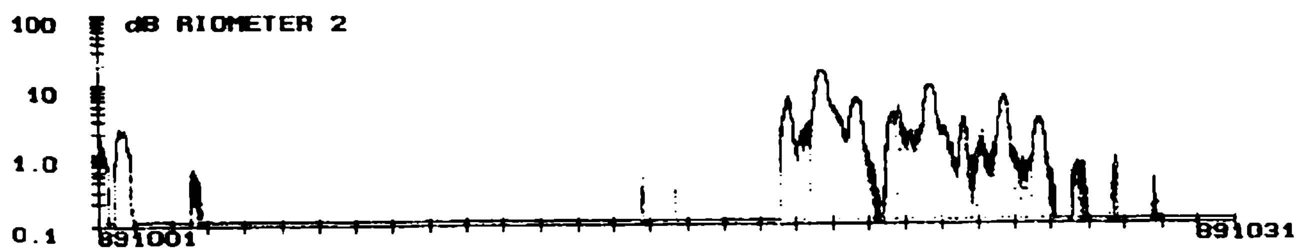
PLOT 117



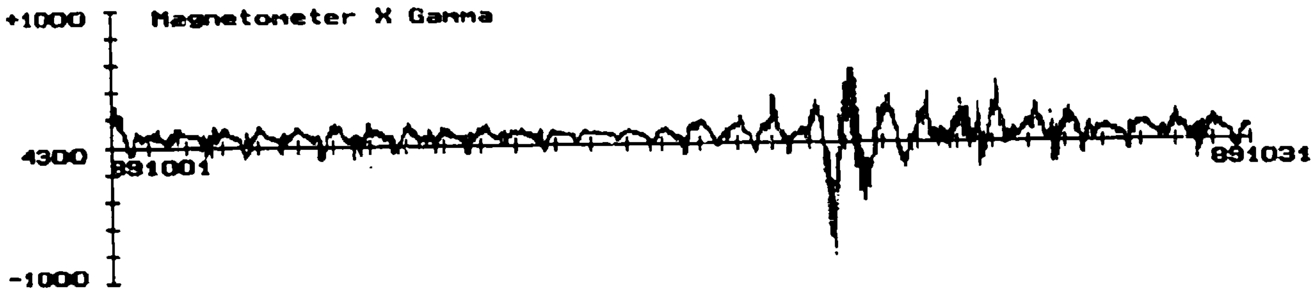
PLOT 118



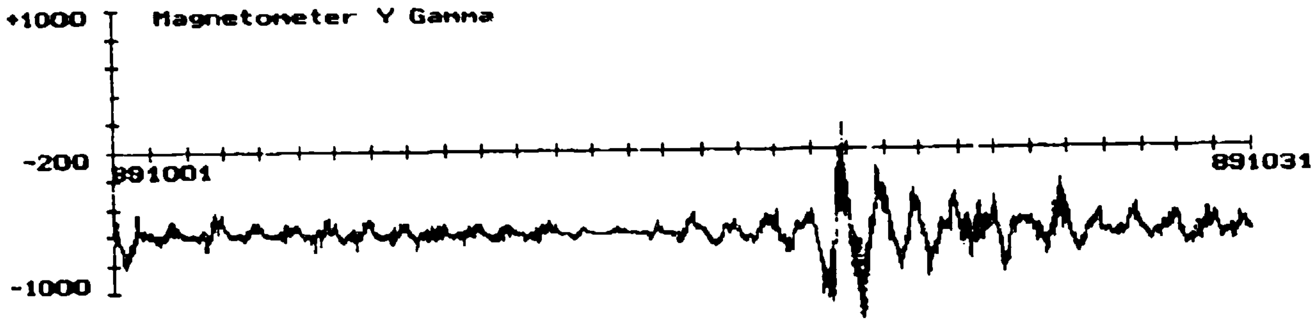
PLOT 119



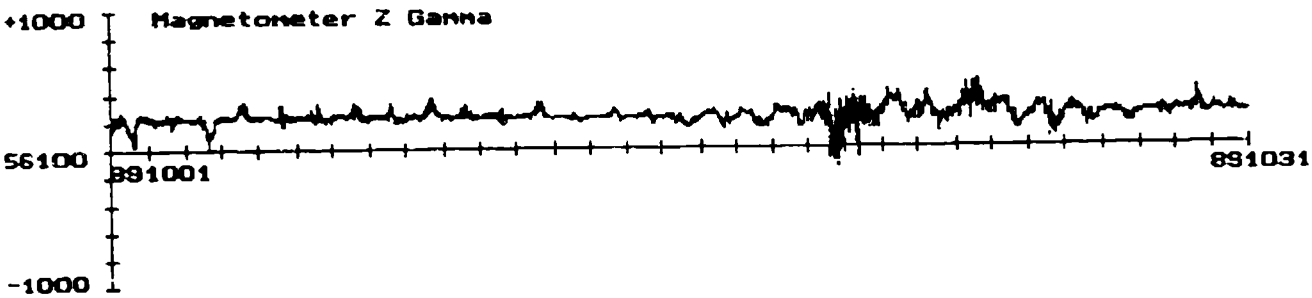
PLOT 120




PLOT 121




PLOT 122




PLOT 123